Naval Education and Training Command

NAVEDTRA 82530
November 1996
0503-LP482-2100

Nonresident Training Course (NRTC)

Steelworker, Volume 2

Only one answer sheet is included in the NRTC. Reproduce the required number of sheets you need or get answer sheets from your ESO or designated officer.

0503LP4822100

Although the words "he," "him," and "his" are used sparingly in this manual to enhance communication, they are not intended to be gender driven nor to affront or discriminate against anyone reading this text.

COMMANDING OFFICER
NETPDTC
6490 SAUFLEY FIELD RD
PENSACOLA, FL 32509-5237

ERRATA #2 1 Jun 2000

Specific Instructions and Errata for
Nonresident Training Course

STEELWORKER, VOLUME 2, NAVEDTRA 82530

1. This errata supersedes all previous errata. No attempt has been made to issue corrections for errors in typing, punctuation, etc., that do not affect your ability to answer the question or questions.

2. To receive credit for deleted questions, show this errata to your local course administrator (ESO/scorer). The local course administrator is directed to correct the course and the answer key by indicating the questions deleted.

3. Assignment Booklet, NAVEDTRA 82530.

Delete the following questions, and leave the corresponding spaces blank on the answer sheets:

Questions

3-16

3-17

3-18

4-45

5-12

7-23

8-51

8-52

STEELWORKER
VOLUME 2
NAVEDTRA 82530

Prepared by the Naval Education and Training Professional Development
and Technology Center (NETPDTC), Pensacola, Florida

Congratulations! By enrolling in this course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program. You have taken an important step in self-improvement. Keep up the good work.

HOW TO COMPLETE THIS COURSE SUCCESSFULLY

ERRATA: If an errata comes with this course, make all indicated changes or corrections before you start any assignment. Do not change or correct the associated text or assignments in any other way.

TEXTBOOK ASSIGNMENTS: The text for this course is Steelworker, Volume 2, NAVEDTRA 12530. The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions in the course. Pay close attention to tables and illustrations because they contain information that will help you understand the text. Read the learning objectives provided at the beginning of each chapter or topic in the text and/or preceding each set of questions in the course. Learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

SELECTING YOUR ANSWERS: After studying the associated text, you should be ready to answer the questions in the assignment. Read each question carefully, then select the BEST answer. Be sure to select your answer from the subject matter in the text. You may refer freely to the text and seek advice and information from others on problems that may arise in the course. However, the answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the same course. Failure to follow these rules can result in suspension from the course and disciplinary action.

ANSWER SHEETS: You must use answer sheets designed for this course (NETPMSA Form 1430/5, Stock Ordering Number 0502-LP-216-0100). Use the answer sheets provided by Educational Services Officer (ESO), or you may reproduce the one in the back of this course booklet.

SUBMITTING COMPLETED ANSWER SHEETS: As a minimum, you should complete at least one assignment per month. Failure to meet this requirement could result in disenrollment from the course. As you complete each assignment, submit the completed answer sheet to your ESO for grading. You may submit more than one answer sheet at a time.

GRADING: Your ESO will grade each answer sheet and notify you of any incorrect answers. The passing score for each assignment is 3.2. If you receive less than 3.2 on any assignment, your ESO will list the questions you answered incorrectly and give you an answer sheet marked "RESUBMIT." You must redo the assignment and complete the RESUBMIT answer sheet. The maximum score you can receive for a resubmitted assignment is 3.2.

COURSE COMPLETION: After you have submitted all the answer sheets and have earned at least 3.2 on each assignment, your command should give you credit for this course by making the appropriate entry in your service record.

NAVAL RESERVE RETIREMENT CREDIT: If you are a member of the Naval Reserve, you will receive retirement points if you are authorized to receive them under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 12 points. (Refer to BUPERSINST 1001.39 for more information about retirement points.)

STUDENT QUESTIONS: If you have questions concerning the administration of this course, consult your ESO. If you have questions on course content, you may contact NETPDTC at:

DSN: 922-1795
Commercial: (904) 452-1795
FAX: 922-1819
INTERNET:
NETPDTC.N314@SMTP.CNET.NAVY.MIL

COURSE OBJECTIVES: In completing this nonresident training course, you will demonstrate a knowledge of the subject matter by correctly answering questions on the following subjects:

Technical Administration

Layout and Fabrication of Sheet Metal and Fiber-glass Duct

Structural Terms/Layout and Fabrication of Structural Steel and Pipe

Fiber Line

Wire Rope

Rigging

Reinforcing Steel

Pre-engineered Structures: Buildings, K-Spans, Towers, and Antennas

Pre-engineered Storage Tanks

Pontoons

Pre-engineered Structures: Short Airfield for Tactical Support

Steelworker Tools and Equipment

Naval courses may include several types of questions--multiple-choice, true-false, matching, etc. The questions are not grouped by type but by subject matter. They are presented in the same general sequence as the textbook material upon which they are based. This presentation is designed to preserve continuity of thought, permitting step-by-step development of ideas. No all courses use all of the types of questions available. You can readily identify the type of each question, and the action required, by reviewing of the samples given below.

MULTIPLE-CHOICE QUESTIONS

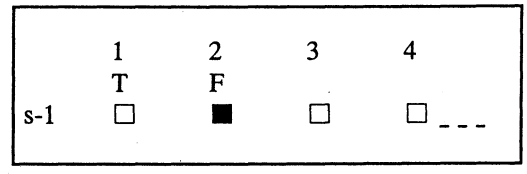
Each question contains several alternative answers, one of which is the best answer to the question. Select the best alternative, and blacken the appropriate box on the answer sheet.

SAMPLE

s-1. The first U.S. Navy nuclear-powered vessel was what type of ship?

1. Carrier
2. Submarine
3. Destroyer
4. Cruiser

Indicate in this way on your answer sheet:



TRUE-FALSE QUESTIONS

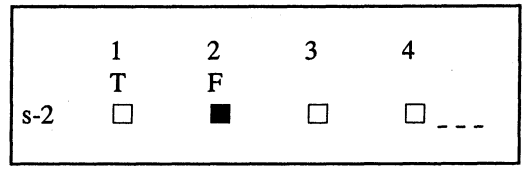
Mark each statement true or false as indicated below. If any part of the statement is false, the entire statement is false. Make your decision, and blacken the appropriate box on the answer sheet.

SAMPLE

s-2. Shock will never be serious enough to cause death.

1. True
2. False

Indicate in this way on your answer sheet:



MATCHING QUESTIONS

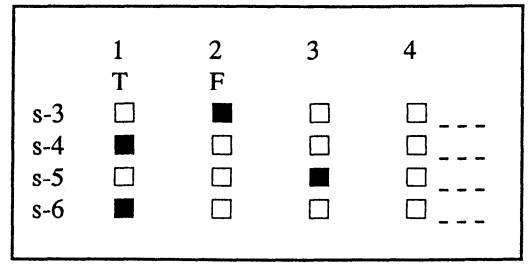
Each set of questions consists of two columns, each listing words, phrases or sentences. Your task is to select the item in column B which is the best match for the item in column A. Items in column B may be used once, more than once. or not at all. Specific instructions are given with each set of questions. Select the numbers identifying the answers and blacken the appropriate boxes on your answer sheet.

SAMPLE

In answering questions s-3 through s-6, SELECT from column B the department where the shipboard officer in column A functions. Responses may be used once, more than once, or not at all.

A. OFFICER	B. DEPARTMENT
s-3. Damage Control Assistant	1. Operations Department
s-4. CIC Officer	2. Engineering Department
s-5. Disbursing Officer	3. Supply Department
s-6. Communications Officer	4. Navigation Department

Indicate in this way on your answer sheet:



ASSIGNMENT 1

Textbook Assignment: "Technical Administration," pages 1-1 through 1-30.

Learning Objective: Identify the principles and techniques a crew leader applies in job planning, supervision, and production.

1-1. When you become a petty officer, you take on which of the following responsibilities?

1. Company clerk
2. Project manager
3. Project estimator
4. Crew leader

1-2. Administration is the mechanical means petty officers use to accomplish which of the following functions?

1. To plan, organize, supervise, manage, and document activities
2. To apply their technical knowledge in directing personnel
3. To ensure their subordinates work as efficiently as possible
4. To set training goals for newly assigned supervisors

1-3. You are assigned duty as a petty officer in charge of a crew. What is your first responsibility before you make any work assignments?

1. To pass on to the operations officer the details of getting the job done
2. To ensure your crew understands what is expected of them
3. To establish daily work goals for your crews
4. To determine whether equipment for the job is appropriate

1-4. To ensure a job is completed on schedule, you should take which of the following actions?

1. Order extra equipment
2. Conduct training
3. Demand quality work
4. Encourage teamwork and establish goals

1-5. To ensure a job is completed on on schedule, you should take which of the following actions?

1. Order extra equipment
2. Conduct training
3. Demand quality work
4. Encourage teamwork and establish goals

1-6. Many young Seabees ignore danger or think a particular regulation is unnecessary. You, as a crew leader, can correct this problem by taking which of the following actions?

1. Rotating work assignments
2. Giving proper instruction and training
3. Criticizing them openly
4. Scheduling projects appropriately

Learning Objective: Identify the procedures for tool kit maintenance, inspection, and material requisitioning.

1-7. A tool kit contains the hand tools required for a crew of what size?

1. Five
2. Two
3. Three
4. Four

1-8. As a crew leader, you must schedule tool kit inventories at what time intervals?

1. Daily
2. Weekly
3. Monthly
4. Bimonthly

1-9. Which of the following forms is a crew leader most likely to use when ordering materials?

1. DD Form 1148
2. DD Form 1250
3. NAVSUP Form 1149
4. NAVSUP Form 1250

1-10. Of the following rate training manuals, which one offers information on the National Stock Number System?

1. Military Requirements for Petty Officer Third Class
2. Blueprint Reading and Sketching
3. Tools and Their Uses
4. Constructionman

Learning Objective: Identify the purpose of reporting labor hours used on given projects, the categories of labor, and the type of information that is entered on the daily labor distribution report.

1-11. A labor accounting system is required to measure the man-hours that a unit spends on various functions.

1. True
2. False

A.	Direct
B.	Indirect
C.	Overhead
D.	Military

Figure 1A

IN ANSWERING QUESTIONS 1-12 THROUGH 1-14, REFER TO FIGURE 1A.

1-12. Labor that contributes to the product but does not produce an end product itself.

1. A
2. B
3. c
4. D

1-13 Labor that does not contribute directly or indirectly to the end product, but includes all labor that must be performed regardless of the assigned mission.

1. A
2. B
3. c
4. D

1-14 Labor that contributes directly to the completion of the end product.

1. A
2. B
3. c
4. D

1-15. What is the labor code for an embarkation?

1. D02
2. M03
3. M08
4. X05

1-16. When you attend a leadership school at Port Hueneme, your time is reported on the daily time card under what labor code?

1. X08
2. XOl
3. T04
4. MO5

1-17. Refer to textbook figure 1-4. The 2 hours shown for Aaron represent time spent in what labor category?

1. Training
2. Overhead
3. Indirect
4. Disaster control operations

1-18. After a daily labor distribution report form is filled out, it should be initialed by what person?

1. The company chief
2. The platoon commander
3. The assistant company commander
4. The company commander

1-19. The daily labor distribution reports from each company are compiled and tabulated by what organizational unit?

1. The Supply Department
2. The Management Department of the Operations Department
3. The Training Department
4. The Engineering and P&E Division

1-20. Information from the daily labor distribution report serves as a feeder report to the operations officer, as well as a construction management analysis source document, for which of the following personnel?

1. Crew leaders
2. Platoon leaders
3. The company chief
4. Each of the above

Learning Objective: Recognize the principles of the Personnel Readiness Capabilities Program (PRCP), the Safety Program, and the responsibilities of key personnel.

1-21. PRCP provides for collecting information on which of the following subjects?

1. Predeployment planning
2. Readiness of an NCF unit
3. Training publications available to the NCF
4. Prior military service education

1-22. Newly acquired skills are reported to which of the following personnel?

1. The company commander
2. The educational services officer
3. The PRCP coordinator
4. The company clerk

1-23. What person directs the safety policy committee?

1. The safety chief
2. The company chief
3. The administration officer
4. The executive officer

1-24. What is the primary objective of the safety policy committee?

1. To develop a safety doctrine and policy for a battalion
2. To discipline personnel involved in an accident
3. To elect a battalion safety chief and members of the committee
4. To review all vehicle accident reports and determine the causes of accidents

1-25. The safety supervisors' committee serves what primary purpose?

1. It maintains safety programs for each project
2. It collects and exchanges safety information and policies between projects
3. It advises the safety division on safety procedures
4. It investigates accidents that occur on the job

1-26. Recommendations for improving safety on the job should be forwarded to the safety policy committee via the safety supervisors' committee.

1. True
2. False

1-27. What safety group should you, as a crew leader, contact when recommending changes in safety matters?

1. Safety division
2. Supervisors' safety committee
3. Safety policy committee
4. Crew safety committee

1-28. As a leader of a crew working on a construction project, you are responsible for which of the following duties?

1. Training your crew members conditions
2. Correcting unsafe practices and conditions
3. Executing certain procedures when a crew member is involved in an accident
4. All of the above

1-29. What person is responsible for conducting short stand-up safety meetings?

1. Safety chief
2. Safety officer
3. Crew leader
4. Company chief

1-30. In addition to discussing project safety during stand-up safety meetings, which of the following topics of concern should be included?

1. Vehicle safety
2. Prestart checks
3. Equipment maintenance
4. All of the above

1-31. What is one of the most practical safety techniques that you, as a crew leader, can apply?

1. Stand-up meetings
2. Reprimanding violators in front of their peers
3. Designating a crew member as a safety representative
4. Leadership by example

Learning Objective: Recognize the procedures and documentation for hazardous material warnings, handling, and turn-in procedures.

1-32. A material safety data sheet (MSDS) is required to be on site for all hazardous material.

1. True
2. False

1-33. A material safety data sheet does NOT contain which of the following information?

1. All hazards associated with exposure to the material
2. Applicable laws governing use
3. Personnel protective equipment/safety precautions
4. First-aid/medical treatment for exposure

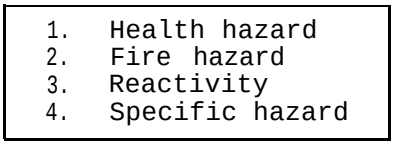


Figure 1B

IN ANSWERING QUESTIONS 1-34 THROUGH 1-37, REFER TO FIGURE 1B.

1-34. In a hazardous code chart, what does the top diamond indicate?

1. 1
2. 2
3. 3
4. 4

1-35. In the hazardous code chart, what does the bottom diamond indicate?

1. 1
2. 2
3. 3
4. 4

1-36. In the hazardous code chart, what does the right diamond indicate?

1. 1
2. 2
3. 3
4. 4

1-37. In the hazardous code chart, what does the left diamond indicate?

1. 1
2. 2
3. 3
4. 4

1-38. The degree of hazard is indicated on the code chart numerically from O through 4. As the number increases, the threat decreases.

1. True
2. False

1-39. Concerning the use of hazardous material, you should practice what safety rule?

1. Draw all material needed for an entire project
2. Draw material between each phase of a project
3. Draw only daily requirements
4. Draw weekly requirements

1-40. Hazardous material must be stored in approved containers and stored what distance from an ignitable source?

1. 15 feet
2. 25 feet
3. 35 feet
4. 50 feet

1-41. When turning in hazardous materials, you must submit a legible MSDS with the material.

1. True
2. False

Learning Objective: Identify principles and techniques for planning and estimating projects.

1-42. In planning a construction project, you should be concerned with which of the following estimates?

1. Equipment
2. Material
3. Manpower
4. All of the above

1-43. Activity quantities provide the basis for preparing the material, equipment, and manpower estimates.

1. True
2. False

1-44. According to NAVFAC P-405, Seabee Planner’s and Estimator’s Handbook, a man-day is based upon how many hours?

1. 8
2. 9
3. 10
4. 12

1-45. According to NAVFAC P-437, Facilities Planning Guide, a man-day consists of how many hours?

1. 8
2. 9
3. 10
4. 12

1-46. A “material takeoff” is also known by what other term?

1. A material estimate
2. An equipment summary
3. A work element
4. A takeoff

1-47. Equipment estimates do NOT contain which of the following information?

1. Types of equipment
2. Number of equipment required
3. Fuel required
4. Time required on site

1-48. As an estimator for a construction project, manpower estimates must contain sufficient detail to list man-days for all ratings assigned to each activity.

1. True
2. False

Learning Objective: Identify the different types of construction drawings and their uses.

1-49. What type of drawings contains size, quantity, location, and relationship of building components?

1. Master plan drawings
2. Project drawings
3. Red-lined drawings
4. As-built drawings

1-50. What type of drawings consists of boundary lines, acreage, locations, and descriptions of existing and proposed structures, existing utilities, north point indicator (arrow), and contour lines?

1. Master plan drawings
2. Project drawings
3. Red-lined drawings
4. As-built drawings

1-51. During construction, you should mark up what type of drawing to indicate a minor change or a field adjustment?

1. Master plan drawings
2. Project drawings
3. Red-lined drawings
4. As-built drawings

1-52. What type of drawing is made to indicate changes to a completed project?

1. Master plan drawings
2. Project drawings
3. Red-lined drawings
4. As-built drawings

1-53. The order of project drawings is always the same.

1. True
2. False

1-54. Title blocks may vary in format but contain the same information.

1. True
2. False

1-55. The revision block is at what location on the drawing?

1. Top left corner
2. Bottom left corner
3. Top right corner
4. Bottom right corner

1-56. A revision block contains what type of revisions?

1. Environmental
2. Structural
3. Supplementary
4. Site

1-57. Graphic scales must be shown prominently on each drawing, because when drawings are reduced in size, the reductions are often not scaled to proportion.

1. True
2. False

1-58. What is the purpose of “specific notes” on a project?

1. To give dimensional information
2. To be explanatory
3. To save space
4. Each of the above

1-59. Working drawings do NOT serve which of the-following functions?

1. Provide a basis for making material, labor, and equipment estimates
2. Complement the specifications; one is complete without the other
3. Provide a means of coordination between ratings
4. Provide extensive environmental and pollution control information

1-60. Civil working drawings do NOT include which of the following plans and information?

1. Site prep and site development
2. Fencing
3. Comprehensive instructions for construction
4. Water supply units

Learning Objective: Identify the BASIC concepts and principles of project management (project packages) .

1-61. A project package consists of a total of how many files.

1. 7
2. 8
3. 9
4. 10

1-62. In a project package, the safety plan is kept in what file?

1. File 1
2. File 5
3. File 3
4. File 7

1-63. At what location in a project package should you find the master activity sheets and the level II?

1. File 1, left side
2. File 3, left side
3. File 3, right side
4. File 1, right side

1-64. What file contains all authorizing and coordinating information about a project?

1. File 1
2. File 2
3. File 3
4. File 4

1-65. The construction activity summary sheets are contained in what file?

1. File 2, right side
2. File 2, left side
3. File 3, right side
4. File 3, left side

1-66. Project level IIIs are located in what file?

1. General information
2. Correspondence
3. Activity
4. Network

1-67. In what file are field adjustment requests filed?

1. Quality control
2. Correspondence
3. Activity
4. Plans

1-68. The project specifications are found in what file?

1. File 5
2. File 3
3. File 7
4. File 9

1-69. A list of long lead items is filed in the left side of what file?

1. File 1
2. File 2
3. File 3
4. File 5

1-70. The right side of the Safety/Environmental file contains which of the following information?

1. Safety plan
2. Highlighted EM 385
3. Environmental plan
4. Each of the above

1-71. The left side of the specifications file contains technical data for the project.

1. True
2. False

ASSIGNMENT 2

Textbook Assignment: "Layout and Fabrication of Sheet Metal and Fiber-glass Duct," pages 2-1 through 2-39.

Learning Objective: Identify the tools and equipment needed for measuring and fabricating sheet metal and recognize their uses.

2-1. The procedure for measuring and marking material for the cutting, drilling, and/or welding of metal is known by the term "layout."

1. True
2. False

2-2. What type of tool is most frequently used to scribe lines on sheet metal?

1. Prick punches
2. Trammel points
3. Scratch awls
4. Dividers

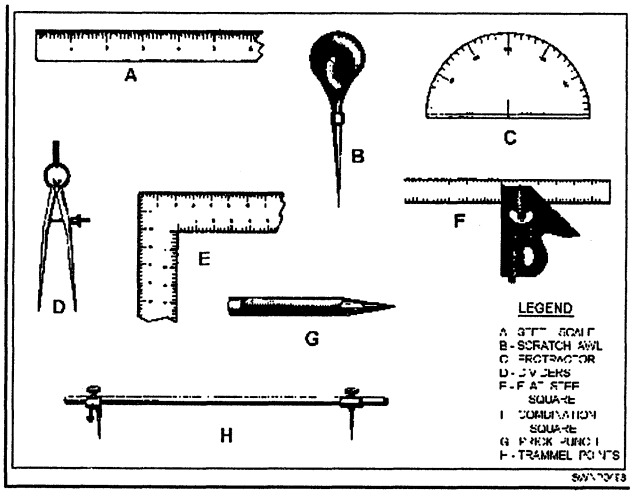


Figure 2A

IN ANSWERING QUESTIONS 2-3 THROUGH 2-6, REFER TO FIGURE 2A.

2-3. To construct parallel lines in layout work, you should first clamp tool A to the base line of your work. What other tools in figure 2A do you need to complete the job?

1. D and C
2. C and G
3. B and E
4. A and D

2-4. You need to draw a line that cuts the base line of your layout work at an angle of 45 degrees. Of the tools in the figure, which one is quickest and easiest to use in constructing this angle?

1. C
2. D
3. E
4. F

2-5. What layout tool should you use to mark a point on your work?

1. B
2. D
3. G
4. H

2-6. Which of the tools is required to scribe a circle having a radius of 22 inches?

1. B
2. C
3. D
4. H

2-7. To construct a right angle by bisecting a base line, you must set the dividers for what distance?

1. To exactly one half of the length of the base line
2. To less than one half of the length of the base line
3. To more than one half of the length of the base line
4. Equal to the length of the base line

2-8. In a simple drip pan layout, the radius of a corner arc is equal to what dimension of the pan?

1. Its depth
2. Its length
3. Its width
4. Its diagonal cross section

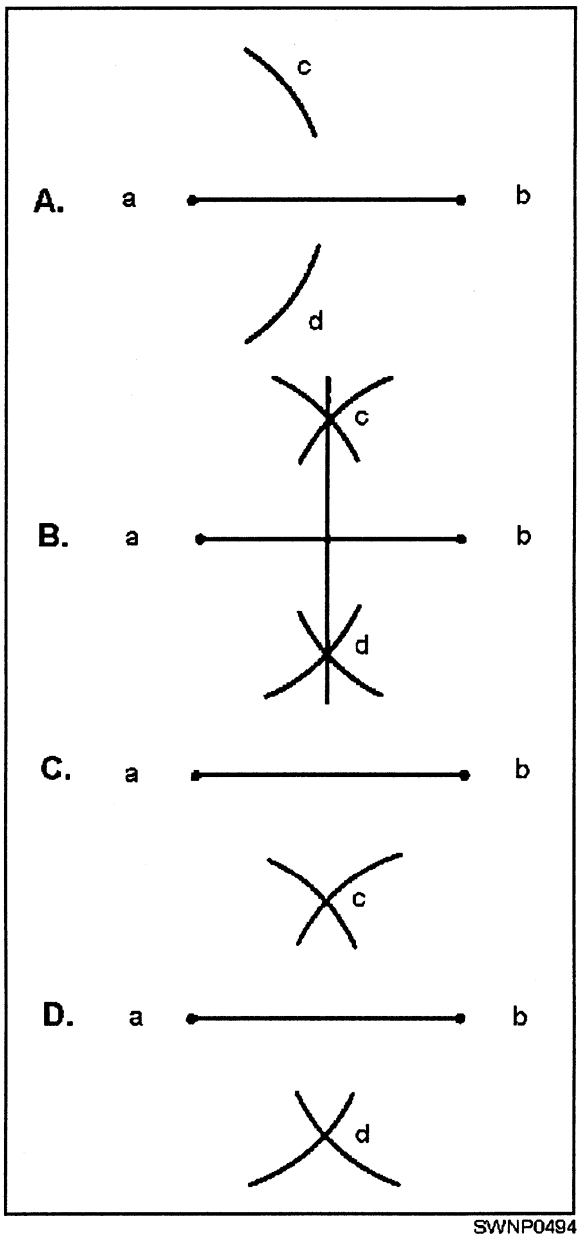


Figure 2B

IN ANSWERING QUESTION 2-9, REFER TO FIGURE TO FIGURE 2B.

2-9. To construct a 90 degree or right angle using steps A through D shown in the figure, you should perform the steps in what sequence?

1. A, B, C, D
2. B, C, A, D
3. C, A, D, B
4. D, B, C, A

2-10. Refer to figure 2-11 in the textbook. To find point F in bisecting angle ABC, you must set the dividers for what distance?

1. To less than one half of the line BD
2. To twice the length of EB
3. To greater than the total length of arc DE
4. To greater than one half of the length of arc DE

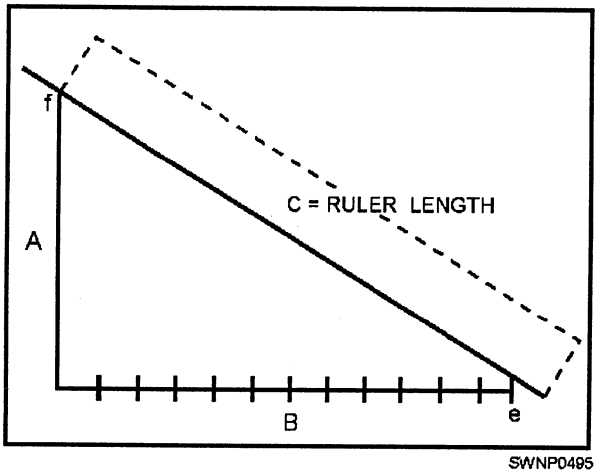


Figure 2C

IN ANSWERING QUESTIONS 2-11 THROUGH 2-13, REFER TO FIGURE 2C.

2-11. Base line B is 10 inches long and you want to divide it into 12 equal parts. Using a rule after drawing line A perpendicular to the base line, you should orient the ruler in which of the following ways?

1. Set the 12-inch mark at (e) and the 0-inch mark at (f)
2. Set the 12-inch mark at (e) and the l-inch mark at a point 4 1/2 inches above (d)
3. Set the 9-inch mark at the midpoint of base line B and the 3-inch mark at the mid-point of line A
4. Set the 9-inch mark at the midpoint of line A

2-12. Your next step in dividing base line B into equal parts is to drop perpendiculars to B from what mark on the ruler?

1. 1 inch
2. 3/4 inch
3. 1/2 inch
4. 1/4 inch

2-13. After line B is divided into 12 equal parts, what is the approximate length of each part?

1. 5/16 inch
2. 7/16 inch
3. 13/16 inch
4. 15/16 inch

2-14. You set dividers for the radius of a circle and strike off this distance on the entire circum-ference. Into how many equal arcs have you divided the circumference?

1. Six
2. Two
3. Three
4. Nine

2-15. Into how many equal parts is the circumference of a circle divided if the lines intersecting at the center of the circle form angles of 30 degrees?

1. 4
2. 6
3. 12
4. 18

2-16. What is the approximate circum-ference of a circle that has a diameter of 18 inches?

1. 45.5 inches
2. 56.5 inches
3. 133.0 inches
4. 365.0 inches

2-17. What is the mathematical formula for determining the area of the stretchout of a cylinder?

1. $A = \pi r$
2. $A = \pi rd$
3. $A = 2\pi r$
4. $A = (\pi d)h$

Learning Objective: Identify uses and operation of tools and equipment used in fabricating sheet metal.

IN ANSWERING QUESTIONS 2-18 THROUGH 2-20, SELECT FROM COLUMN B THE TYPE OF SNIPS THAT SHOULD BE USED TO MAKE THE CUTS IN COLUMN A.

	A. CUTS	B. TYPES OF SNIPS
2-18.	Outside circles	1. Circular
	1. 1 2. 2 3. 3 4. 4	2. Aviation 3. Hawkbill 4. Beakhorn
2-19.	Compound curves and intricate designs	
	1. 1 2. 2 3. 3 4. 4	
2-20.	Internal openings, such as rings or holes	
	1. 1 2. 2 3. 3 4. 4	

2-21. Squaring shears are designed to cut which of the following materials?

1. Wire rope
2. Steel rods
3. Sheet metal
4. Fiber line

2-22. Metal stakes are used to make an assortment of bends by hand and to finish many types of work.

1. True
2. False

IN ANSWERING QUESTIONS 2-23 THROUGH 2-25, SELECT FROM COLUMN B THE TYPE OF STAKE THAT SHOULD BE USED TO FORM THE SHAPES IN COLUMN A.

	A. SHAPES	B. STAKES
2-23.	Forming, seaming, and riveting pieces and parts of pipe mandrel	1. Conductor 2. Hollow pipe 3. Blowhorn 4. Beakhorn
	1. 1 2. 2 3. 3 4. 4	
2-24.	Blunt and slender tapered jobs	
	1. 1 2. 2 3. 3 4. 4	
2-25.	Riveting and shaping round and square work	
	1. 1 2. 2 3. 3 4. 4	

2-26. What part of the bar-folding machine is used to make right angles and 45-degree bends?

1. The depth gauge
2. The bar handle
3. The wing
4. The angle stop

2-27. A total of how many adjustments must be made on a cornice brake before you can use the machine to bend sheet metal?

1. One
2. Two
3. Three
4. Four

2-28. What feature on the cornice brake enables you to make as many duplicate bends as required?

1. The clamping device
2. The balancing weight
3. The stop gauge
4. The mold clamps

2-29. The box and pan brake is often referred to as a finger brake.

1. True
2. False

2-30. When forming a curved shape, you can fabricate the most accurate bend by using what piece of equipment?

1. A stake
2. A mandrel
3. A pipe
4. A slip-roll forming machine

2-31. The slip-roll forming machine is designed to allow one end of the top front roll to be released quickly so you can perform what task easily?

1. Removal of the work
2. Cleaning operations
3. Repairs on the machine
4. Adjustments to the machine

2-32. What operation of the combination rotary machine is used to reduce the size of the end of a cylinder?

1. The beading
2. The burring
3. The crimping
4. The clamping

Learning Objective: Recognize the methods of pattern development and identify types of edges, seams, and notches used in fabricating sheet metal.

2-33. Instead of scribing directly on the metal when a single piece is being made in quantity, you can make a pattern or template and transfer it to the metal.

1. True
2. False

2-34. Assume that the cylinder shown in textbook figure 2-51 has a diameter of 8 1/2 inches. Excluding the seam, what is the length of the stretchout?

1. 26 5/8 inches
2. 38 3/4 inches
3. 51 7/8 inches
4. 61 5/8 inches

2-35. A patternmaker decides to divide a half plan or top view into 12 equal parts. What number of divisions will be required for the stretch-out line?

1. 6
2. 12
3. 24
4. 48

2-36. What method of pattern development should you use to develop a pattern for an object that has a tapering form with lines converging at a common center?

1. Radial line
2. Parallel line
3. Triangulation
4. Scratching

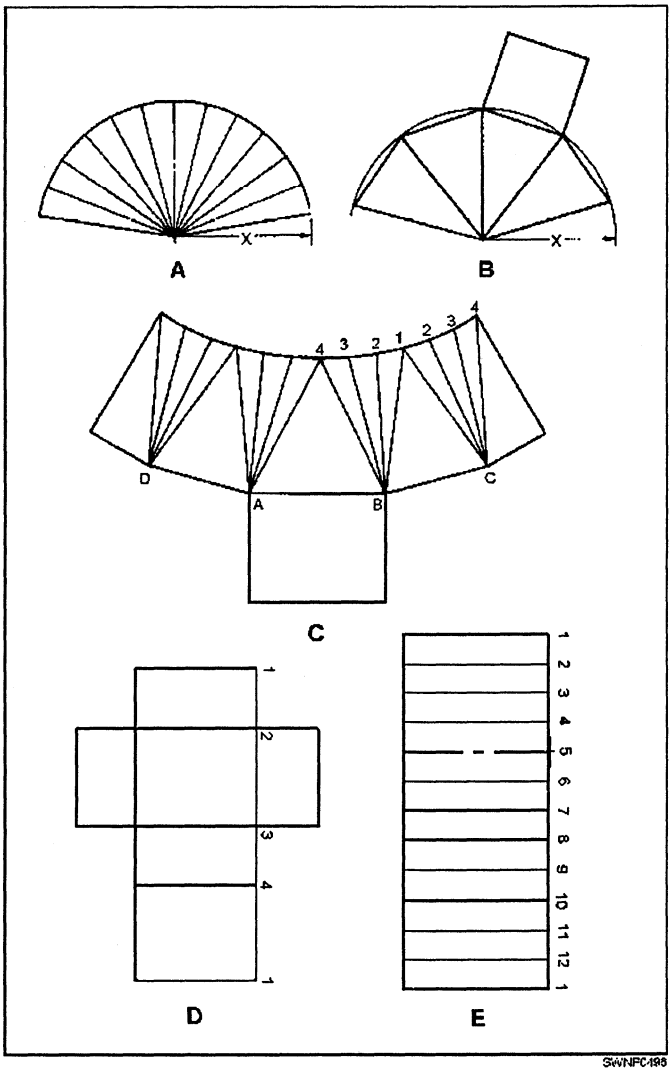


Figure 2D

IN ANSWERING QUESTIONS 2-37 THROUGH 2-39, REFER TO FIGURE 2D.

2-37. What stretchouts are developed by the radial-line method?

1. A and B
2. A and C
3. C and D
4. C and E

2-38. Triangulation is used to develop what pattern?

1. A
2. C
3. D
4. E

2-39. What pattern will ultimately fold or roll into a cylinder?

1. A
2. C
3. D
4. E

IN ANSWERING QUESTIONS 2-40 THROUGH 2-42, REFER TO FIGURE 2-52 IN THE TEXTBOOK.

2-40. The radial line method is used to develop a frustrum of a right cone.

1. True
2. False

2-41. The stretchout pattern of the frustrum has been stepped off into how many spaces?

1. 6
2. 7
3. 12
4. 14

2-42. The length of the numbered line on the stretchout from 1 to 1 is equal to what measurement?

1. Height of the frustrum
2. Circumference of the base of the cone
3. Radius of the top of the frustrum
4. Slant height of the frustrum

IN ANSWERING QUESTIONS 2-43 THROUGH 2-45, ASSUME THAT YOU ARE TO DRAW A PATTERN OF A TRANSITION PIECE FOR A SQUARE DUCT AND A SMALLER ROUND DUCT, AS SHOWN IN TEXTBOOK FIGURE 2-53.

2-43. What view of the transition piece should you draw first?

1. A
2. B
3. C
4. D

2-44. What triangle should you develop first in E?

1. B3 and 4
2. B4 and 5 or C7 and 8
3. D7 and 6
4. A2 and 1 or B2 and 1

2-45. You have constructed perpendicular bisectors of AB, BC, CD, and DA in E and have established the location of point 0_0. What step should you perform next in order to check the overall symmetry of your transition piece?

1. Swing length D5 from point 5
2. Swing an arc of radius A2 from point A
3. Swing arcs A and B from point O
4. Swing arcs from point G that will intersect at point O

Learning Objective: Identify the various sheet-metal joints and locking methods used in the fabrication of sheet-metal sections.

2-46. When fabricating a wired edge to a cylinder, you must add how much edging to a pattern?

1. 1 1/2 times the thickness of the metal
2. 2 1/2 times the diameter of the wire to be used
3. Twice the diameter of the upper burring roller
4. One half of the diameter of the wire to be used

2-47. In the fabrication of rectangular duct, what seam is used most often?

1. Grooved
2. Pittsburgh lock
3. Lap
4. Standing

2-48. When laying out a pattern, you consider what feature last?

1. Seams
2. Laps
3. Notches
4. Edges

2-49. What type of notch is used on a corner when a single-hemmed edge is to meet a 90-degree angle?

1. Square
2. Slant
3. V
4. Wire

2-50. What type of connection is used to join a flat sheet and a round pipe/fitting?

1. Dovetail seam
2. Drive slip
3. Pocket slip
4. Standing seam

Learning Objective: Identify the various joints, installation procedures, metal requirements, and connections used in sheet-metal duct systems.

2-51. What type of screw is most often used in sheet-metal work?

1. Self-tapping
2. Machine
3. Thread-cutting
4. Drive

2-52. Drive screws are simply driven into sheet metal.

1. True
2. False

2-53. Tinners are designated by their weight per 1,000 rivets.

1. True
2. False

2-54. The distance from the center of the rivet to the edge of the sheet must equal how many rivet diameters?

1. 1
2. 1 1/2
3. 2
4. 2 1/2

2-55. The correct method for riveting using tinner rivets is to draw, upset, and head the rivet.

1. True
2. False

2-56. What gauge of aluminum sheet metal is required to construct a duct 62 inches wide at the top and 28 inches high on the sides?

1. 26
2. 24
3. 18
4. 16

2-57. You are to construct a duct of 24 gauge sheet metal. Each section is 7 feet 10 inches long. If the total system length is 60 feet, you should place the bracing angles at what location?

1. 2 feet on center along the length of the duct
2. 4 feet on center along the length of the duct
3. 2 feet from each joint
4. 4 feet from each joint

2-58. The cross breaking of a duct having a flat side of 18 inches or greater can be omitted under which of the following conditions?

1. The duct is installed in the vertical position
2. The material used is at least reinforced at the edges of each duct segment
3. The duct is insulated with approved materials
4. The duct is insulated with rigid insulation and the sheet metal used is 2 gauges heavier

2-59. When securing duct systems to heating and cooling units, you should use what material to fabricate the flexible connections?

1. Light-gauge sheet metal
2. Asbestos
3. Heavy canvas
4. Aluminum

2-60. When “S” slips and drive slips are used on a duct system, you lock the joint into position in what way?

1. By bending the “S” slip over the drive slip
2. By bending the drive slip over “S” slip
3. By cutting off the drive slip even with the “S” slip and welding each corner
4. By center punching the “S” slip

Learning Objective: Identify material requirements, fabrication, and installation procedures used in fiber-glass duct systems.

2-61. Fiber-glass duct has which of the following advantages?

1. Added insulating value
2. Ease of fabrication and handling
3. Ease of installation
4. Each of the above

2-62. In all applications, the inside diameter is the determining factor of the duct size.

1. True
2. False

2-63. Fiber-glass duct must not be used in a heating system in which the heat generated exceeds what temperature?

1. 150°F
2. 200°F
3. 250°F
4. 300°F

2-64. What are the dimensions of the galvanized steel straps used to support fiber-glass duct?

1. 3/4-inch diameter by l/8-inch thick
2. l-inch diameter by l/8-inch thick
3. l-inch diameter by l/16-inch thick
4. 1 l/8-inch diameter by 1 l/16-inch thick

2-65. You have fabricated a fiber-glass duct system that has a 30-inch diameter. At what distance should the supports be placed?

1. 6-foot centers
2. 2-foot centers
3. 8-foot centers
4. 4-foot centers

ASSIGNMENT 3

Textbook Assignment: "Structural Steel Terms/Layout and Fabrication of Steel and Pipe," pages 3-1 through 3-29.

Learning Objective: Identify structural steel members by appropriate terminology and recognize steel structural erection rocedures.

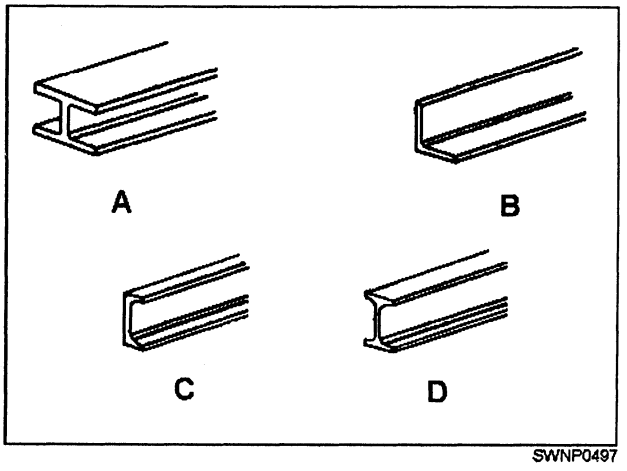


Figure 3A

IN ANSWERING QUESTIONS 3-1 AND 3-2, REFER TO FIGURE 3A.

3-1, What structural shape does the designation W6 x 13 fit best?

1. A
2. B
3. C
4. D

3-2. What structural shape does the classification S15 x 42.9 indicate?

1. A
2. B
3. C
4. D

3-3. A piece of steel plate 3 feet square weighs 180 pounds. What is the classification of this plate?

1. 10-pound plate
2. 20-pound plate
3. 30-pound plate
4. 40-pound plate

3-4. A 10-foot piece of steel that is 3/8-inch thick and 2 inches wide is classified as a

1. bar
2. strip
3. sheet
4. plate

3-5. What sequence is the proper order you should follow for the erection of structural members?

1. Girders, bearing plates, anchor bolts, columns, beams
2. Anchor bolts, column plates, girders, bearing plates, beams
3. Anchor bolts, bearing plates, columns, girders, beams
4. Bearing plates, anchor bolts, columns, girders, beams

3-6. When cutting the holes in bearing plates to receive anchor bolts, you cut the holes larger than the bolts for what reason?

1. To allow for height adjustment
2. To permit lateral adjustment
3. To compensate for angle connections
4. To allow space for welding of columns

3-7. Bearing plates are brought to their proper levels by

1. installing shim packs
2. welding the plates to the bearing plates
3. forcing the grout under the bearing plates
4. using locknuts

3-8. What structural shapes are most often used in columns?

1. Standard beam
2. Tee shapes
3. Pipes
4. Wide flange beam

3-9. What structural steel member is used primarily to span from column to column horizontally?

1. Beam
2. Truss
3. Girder
4. Column splices

3-10. Which of the following members form a lightweight, long-span system used as floor supports and built-up roofing supports?

1. Bar joist
2. Truss
3. Beam
4. Girder

3-11. Workers have installed diagonal braces between bays of a truss system. Their next step is to secure the roof system with what structural members?

1. Angle ties
2. Sway frame
3. Diagonal locking bars
4. Bottom chord extensions

3-12. When using purlins to span roof trusses, you should ensure the legs face in what direction?

1. Up toward the center or apex of the roof
2. Flat with the face of the channel face directly toward the truss
3. Downward with both legs welded to the truss
4. Outward or down toward the slope of the truss system

3-13. What structural members are used to frame the sides of a building which are attached to the outside perimeter columns?

1. Eave struts
2. Purlins
3. Girts
4. Ridge plates

Learning Objective: Identify methods of fabricating plate and structural shapes and the procedures for cutting, forming, and joining plate steel and structural steel shapes.

3-14. When laying out a plate with many parts, you must consider which of the following factors?

1. Time required
2. Economic use of material
3. Accuracy of measurements
4. All of the above

3-15. A job has been laid out and is determined to be accurate. At this time, what modification should be made to all cutting lines?

1. Cut them with a torch on the inside of the kerf
2. Center punch, then cut them with the kerf on the outside edge of the reference lines
3. Transfer to patterns before cutting them so the work can be checked after cutting
4. Lightly paint them to preserve the layout lines

3-16. When a 10-inch beam is connected to a 10-inch girder with the web of one end butted to the side of the other, the required layout is indicated by what letter?

1. A
2. B
3. E
4. H

3-17. The beam S 12 x 35 encloses the girder W 10 x 39, and it extends above the girder 2 inches. The beam butts the girder together at the center line of the girder. The bottom flange is flush with the bottom of the girder flange. What layout is required?

1. C
2. F
3. G
4. H

3-18. As the webs of the girder W 10 x 39 and beam S 8 x 23 are connected and welded, what beam connection layout must be used for the beam S 8 x 23? (The top flange is flush.)

1. A
2. B
3. D
4. E

Learning Objective: Identify the procedures for laying out structural members.

3-19. Which of the following conditions must exist before you lay out steel members ?

1. Adequate lighting
2. All required tools are on hand
3. An accurate field drawing or sketch
4. All of the above

3-20. Structural shapes are more difficult to lay out than plate because the reference lines are not always visible.

1. True
2. False

3-21. When two beams of equal dimensions are fitted together, coping is required so one will butt up against the web of the other. You can determine the size of cope needed

1. by dividing the flange width by 1/8, then adding 1/16 inch
2. by dividing the flange width by 1/2, then subtracting 1/2 of the thickness of the web and adding 1/16 inch
3. by dividing the flange width by 1/4, then adding 1/8 inch
4. by dividing the flange width by 1/2, then adding 1/2 of the thickness of the web and subtracting 1/16 inch

3-22. The legs used to attach to intersecting steel to make a connection are referred to as

1. connection legs
2. web legs
3. fit-up legs
4. gauges

3-23. Outstanding legs are the legs of the angles that attach the supporting angle or intersected steel beam.

1. True
2. False

3-24. The lines in which holes in the angle legs are drilled are known as what type of lines?

1. Dimension
2. Layout
3. Gauge
4. Drill

3-25. On what part of a connection angle does the distance from the heel of the angle to the first gauge line remain constant?

1. Web leg gauge
2. Outstanding leg
3. Gauge line
4. Top flange

3-26. The standard 3-inch distance between the holes on any gauge line is known as

1. leg gauge
2. pitch
3. web leg gauge
4. dimension angle

3-27. When a beam is joined to the flange of a vertical member, you should use what type of connection?

1. Cap plate
2. Direct insert
3. Seated
4. Slotted angle

Learning Objective: Identify procedures for laying out proposed metalwork.

3-28. A template is to be used as the pattern for the construction of a large number of precision metal parts. This template should be made of what material?

1. Graph paper
2. Plain white paper
3. Template paper
4. Metal

3-29. When using templates to help lay out a steel member, you should make sure the identifying marks on the templates and the member correspond to which of the following plans or drawings?

1. Erection
2. Detail
3. Flat
4. Field

3-30. What information does the erection mark on a member provide?

1. The location of the member during erection
2. Date of fabrication
3. The sequence of erection
4. The erection completion date

Learning Objective: Identify pipe layout operations, procedures in constructing design patterns for pipe, and methods of joining pipe into different arrangements.

3-31. To fabricate 25 pieces of pipe of the same diameter and layout dimensions, you should use the shop method of making templates.

1. True
2. False

3-32. When quartering a pipe before proceeding to lay out a joint, you should place the inside angle of the framing square against the pipe after taking what action?

1. Leveling one leg of the framing square
2. Blocking one leg of the framing square
3. Blocking the pipe
4. Leveling the pipe

3-33. What is the first step in developing a template layout for pipe?

1. Drawing a circle equal to the outside diameter of the pipe
2. Constructing the template angle equal to twice the angle of the turn
3. Dividing the circumference of the projected view by one half
4. Bisecting the template angle

3-34. The curve in view C of textbook figure 3-45 is determined

1. by spacing the perpendicular line in view C to equal the outside dimension of view A
2. by extending the line a-i in view C
3. by basing the length of the perpendicular lines in view C on 1/2 of the length of the outside diameter of view A
4* by joining in a smooth curve the set of points formed by the intersection of perpendicular lines drawn from the base line with parallel lines drawn from the point on a-i

3-35. In makinq a simple miter turn, you perform what step after determining the cutback measurement?

1. Measure one half of the distance to the cutback on the vertical plane
2. Mark one half off the cutback measurement along the center line on top of the pipe
3. Lock the protractor blade
4. Determine the outside radius of the pipe

3-36. Assume you are making a full-sized drawing to determine the cut necessary for a two-piece welded turn where the angle of turn of the pipe is 60 degrees. First, you should draw the center lines to intersect as shown in textbook figure 3-46. Then you should

1. lay the pipe over the drawing so its center line will intersect point b
2. lay the pipe over the drawing so its edges will intersect points d and e
3. draw lines a-b-c-d
4. draw the outlines of the pipes

3-37. In view A of textbook figure 3-49, the distance 1-P is equal to

1. the diameter of the pipe
2. the radius of the pipe
3. the thickness of the pipe wall
4. double the thickness of the pipe wall

3-38. In what position should the protractor be locked to show the number of degrees of turnaway from the header to fabricate a branch-to-header connection of equal diameter pipe?

1. At an angle equal to the degree of turnaway
2. At half of the angle of turnaway
3. At one third of the angle of turnaway
4. At one fourth of the angle of turnaway

3-39. In textbook figure 3-50, the cutback measurements for laying out the end of the branch are the distances represented by what letters?

1. EC and AB
2. AB and BC
3. DA and EC
4. BC and DA

3-40. Refer to textbook figure 3-51. Where a branch is welded to a large header, what should be the distance on each side of the branch between points A and B?

1. Same as or a little more than the thickness of the branch wall
2. Same as or a little less than the thickness of the branch wall
3. Same as or a little more than the thickness of the header wall
4. Same as or a little less than the thickness of the header wall

3-41. In fabricating a three-piece connection of equal diameter pipe, you must decide upon the size of the open angle between each pair of center lines for what reason?

1. To determine the position of the center lines
2. To determine the angle of the adjoining sides of adjacent branches
3. To quarter the ends of the three pieces of pipe
4. To apply circumferential lines to each piece of pipe

IN ANSWERING QUESTION 3-42, REFER TO TEXTBOOK FIGURE 3-54 AND TABLE 3-2.

3-42. Of the following paired cutback measurements, which belongs to angle ACG?

1. AB = 1/16 inch and FE = 6 inches
2. AB = 1 1/16 inches and FE = 4 1/8 inches
3. FE = 6 inches and ED = 4 1/8 inches
4. FE = 1/16 inches and CD = 6 inches

3-43. Refer to textbook figure 3-54. Without the use of templates or tables, how do you locate point B of the true Y?

1. By determining the vertex of the triangle ABC
2. By constructing a perpendicular line from point D to bisect line AC
3. By intersecting the center lines of the three pipes
4. By intersecting lines AB and BC

3-44. In the preparation of an orange peel template, such as the one shown in textbook figure 3-57, which of the following projection lines are taken from view A?

1. B-C and A1-B1
2. A-B and B-B1
3. B-B1 and X-Xl
4. A1-B1 and X-X2

3-45. When cutting a pipe with a hand torch, you use what type of cutting process to hold the cutting torch perpendicular to the interior center line of the pipe at every point?

1. Miter
2. Radial
3. Reverse
4. Concentric

Learning Objective: Identify procedures for pipe bending, including heat bending and wrinkle bending.

3-46. What are the flange spiders of a center line template made of wire used for in pipe bending?

1. To clamp the ends of the wire
2. To maintain a constant clearance around the pipe
3. To indicate pipe clearance
4. To indicate the center line of the pipe

3-47. Before heating a pipe, what action, if any, should you take to prevent a reduction in the cross-section area of a hot-bend pipe?

1. Pack it with wet sand
2. Pack it with dry sand
3. Pack it with wet packing
4. None

3-48. What is the technique for applying heat to the bend area of the pipe shown in textbook figure 3-62?

1. First, heat ends A and B, then the part in between
2. First, heat the area midway between A and B, then the ends
3. First, heat the outside (heel) of the bend, then the inside (throat)
4. First, heat the inside (throat) of the bend, then the outside (heel)

3-49. Flat spots in hot-bent copper pipe are caused by which of the following factors?

1. Improper heating
2. Not enough support for the pipe wall
3. Stretch in the outside (heel) of the bend
4. All of the above

3-50. The use of which of the following bending techniques should prevent wrinkles and flat spots in properly packed and heated copper pipe?

1. Bending so all the stretch takes place at the center of the bend area, none on the ends
2. Bending so all the stretch takes place at the ends of the bend area, none at the center
3. Bending so more of the stretch takes place at the center of the bend area than at the other end
4. Dividing the bend area into segments, then bending one segment at a time so stretching is evenly spread over the entire area

3-51. In bending steel pipe, you can control wrinkles and flat spots at the throat of a bend by over-bending, then pulling the end back to round out the flat spot.

1. True
2. False

3-52. Pipe made of what material is likely to break if overbent and then pulled back?

1. Steel
2. Brass
3. Copper
4. Aluminum

3-53. In hot bending aluminum pipe with a torch, you should use which of the following techniques?

1. Keep the flame on the throat while the pipe is being bent
2. Heat only the throat of the bend and avoid overheating
3. Notice changes in heat color to determine the proper bending temperature
4. Overheat then remove heat when bending starts

3-54. When using the wrinkle-bending technique to make a 60-degree bend in a pipe, you should make a total of how many wrinkles to keep from buckling the pipe?

1. One or two
2. Two or three
3. Three or four
4. Five or more

3-55. What technique should you use to wrinkle-bend a 12-inch-diameter pipe?

1. With one torch, heat a strip about 2 feet long and 2 to 3 inches wide along the throat of the planned bend
2. With one torch, heat a strip about 2 feet long and 2 to 3 inches wide along the heel of the planned bend
3. With more than one torch, heat a strip about 2 feet long and 2 to 3 inches wide along the throat of the planned bend
4. With more than one torch, heat a strip about 2/3 of the circumference of the pipe, and 2 to 3 inches wide along the throat of the planned bend

3-56. When bending a heated pipe, you should use what technique, if any?

1. While holding one end of the pipe firmly in position, lift the other end
2. While holding the midpoint of the pipe on the ground, lift both ends at the same time
3. While holding the midpoint of the pipe on the ground, lift one end then the other
4. None

ASSIGNMENT 4

Textbook Assignment: "Fiber Line" and "Wire Rope," pages 4-1 through 5-15.

Learning Objective: Identify types, fabrication of, size designations, and proper handling and care of fiber line.

4-1. What is the primary reason manila line is preferred for use as standard issue line?

1. Its resistance to wear
2. It is waterproof
3. Its quality and relative strength
4. It is easy to handle

4-2. The primary reason for the use of nylon line is that it

1. is waterproof
2. is resistant to abrasion
3. resumes normal length after being stretched
4. has a breaking strength that is nearly 3 times greater than that of manila line

4-3. Fiber line is fabricated in three twisting operations.

1. True
2. False

4-4. Which, if any, of the following types of line is formed from three twisting operations in a right-hand direction?

1. Hawser laid
2. Shroud laid
3. Cable laid
4. None of the above

4-5. The circumference of a 1 1/4-inch manila line is equal to about how many millimeters?

1. 29
2. 32
3. 38
4. 44

4-6. What is the maximum size of fiber line normally carried in stock?

1. 12 inches
2. 14 inches
3. 16 inches
4. 18 inches

4-7. You may have to order line by diameter, rather than circumference, and refer to it as rope.

1. True
2. False

4-8. Soap is not used to clean fiber line because

1. it shrinks the line
2. it creates abrasion
3. it causes deterioration of fibers
4. it takes the oil out of the line

4-9. When nylon line becomes slippery with grease or oil, it should be cleaned with what solvent(s)?

1. Acetone only
2. Either kerosene or diesel fuel
3. Alcohol or gasoline
4. Gasoline only

4-10. Which of the following fabrics should you use to apply whippings to a line?

1. Rope yarn
2. Marline
3. Houseline
4. Twine

4-11. When nylon line is properly handled and maintained, it should last five times longer than manila line subjected to the same use.

1. True
2. False

4-12. Which of the following agents can cause damage to a line that is hard to detect by visual examination?

1. Storage room containing chemicals
2. Lime
3. Direct sunlight
4. Each of the above

4-13. When stowing wet line, you should always select a heated well-ventilated space to promote rapid drying.

1. True
2. False

4-14. A line that is kinked from excessive turns should be given a thorough footing by

1. coiling the line down clockwise and then pulling the bottom end of the coil up and out of the middle of the coil
2. coiling the line down counterclockwise and then pulling the bottom end of the coil up and out of the middle of the coil
3. taking an end at the inside bottom of the coil and after pulling it free, coiling the line down clockwise
4. taking an end at the inside bottom of the coil and after pulling it free, coiling the line down counterclockwise

4-15. Which of the following methods of inspecting fiber line for safety is approved?

1. Visual inspection
2. Smell test
3. Fiber break test
4. Each of the above

4-16. The breaking strength of a line is considerably higher than its safe working load to account for what factor?

1. The different applications of pressure due to load sizes
2. The strain imposed by bending over sheaves in a block
3. Excessive vibration
4* Exposure to moisture

4-17. You are going to use a new 2-inch manila line to hoist a load, and you do not have tables to use to determine the safe working load (SWL) of the line. This situation requires you to use the “rule of thumb” formula to calculate the SWL for the 2-inch line. By doing so, you determine the SWL for the line is

1. 400 pounds
2. 600 pounds
3. 800 pounds
4. 900 pounds

4-18. What is the breaking strength of a 2 l/2-inch fiber line?

1. 4,625 pounds
2. 4,825 pounds
3. 5,225 pounds
4. 5,625 pounds

4-19. The safety factor of a line is the ratio between the breaking strength and the safe working load.

1. True
2. False

4-20. Nylon has a breaking strength approximately three times greater than that of manila line. What is the breaking strength of a 2-inch nylon line?

1. 7,600 pounds
2. 8,6oo pounds
3. 9,600 pounds
4. 10,600 pounds

4-21. Nylon line can be stretched what percentage of its length before it will part?

1. 20%
2. 30%
3. 40%
4. 50%

4-22. Although nylon line is superior in many ways to manila line, what characteristic can cause it to be hazardous?

1. It is very smooth and slips through the hands easily
2. It may part when stretched more than 30%
3. The snapback is severe when a heavy strain is released
4. Freezing produces a slight loss of stretch

Learning Objective: Recognize the fundamentals of making knots, bends, and hitches.

4-23. The free or working end of a line is known as the

1. bight
2. running end
3. tag end
4. open end

4-24. What type of knot is best used to tie two lines of the same size together so they will not slip?

1. Reef
2. Figure eight
3. Overhand
4. Sheepshank

4-25. Which of the following types of knots is used to take a load off a weak section out of line and can also be used to shorten a line?

1. Reef
2. Figure eight
3. Overhand
4. Sheepshank

4-26. When tying lines together that are unequal in size, you should use what type of knot?

1. Becket bend
2. Bowline
3. Running bowline
4. Half hitch

4-27. A free-running lasso that will not tighten up on the standing part of the line is provided by what knot?

1. Bowline
2. Running bowline
3. Spanish bowline
4. French bowline

4-28. When tying up timber or anything that is round or nearly round, you should use what type of hitch?

1. Barrel
2. Clove
3. Half
4. Scaffold

Learning Objective: Recognize the fundamentals of splicing fiber line.

4-29. A properly made short splice will retain up to 50% of the strength of the line, while a properly tied knot will retain 100% of its strength.

1. True
2. False

4-30. What type of tape is used for whipping the strands and lines in nylon line instead of seizing stuff as in manila line?

1. Duct
2. Aluminum
3. Friction
4. Strapping

4-31. Because nylon line is smooth and elastic, at least how many extra tucks are required when splicing it?

1. One
2. Two
3. Three
4. Four

4-32. What type of splice should be used to run freely through a block?

1. Back
2. Long
3. Short
4. Eye

4-33. When there is not much overlap for splicing, you should use what type of splice?

1. Back
2. Long
3. Short
4. Eye

4-34. A back splice should be used to prevent a line from unlaying or unraveling at the end of a line.

1. True
2. False

Learning Objective: Recognize how wire rope is fabricated and identify the different grades, lays, and types of wire rope.

4-35. What type of rope should you select for a job that requires wire rope of great flexibility while maintaining adequate strength?

1. 6 by 7 fiber core
2. 6 by 19 wire strand core
3. 6 by 24 wire rope core
4. 6 by 37 fiber core

4-36. What type of wire rope should you select for use on a permanent hoist in which the rope runs through several sheaves and onto a small-diameter drum?

1. Hot-dipped galvanized wire rope with a fiber core
2. Electroplated wire rope with an independent wire rope core
3. Plain wire rope with a fiber core
4. Hot-dipped galvanized wire rope with a wire strand core

4-37. Wire rope that withstands crushing the best has which of the following properties?

1. Wires that are uncoated
2. Is made of improved plow steel
3. An independent core
4. A galvanized wire core

4-38. How does preformed wire rope compare to nonpreformed wire rope?

1. It is harder to splice
2. It is more flexible
3. It is likely to fly apart when cut or broken
4. It is less flexible

4-39. The three grades of plow steels used in manufacturing wire rope can have a variation in tensile strength of

1. 10,000 psi
2. 20,000 psi
3. 30,000 psi
4. 40,000 psi

4-40. When looking at a wire rope, you observe that the wires in the strands are laid to the right and the strands are laid to the left. This wire rope has what type of lay?

1. Regular right lay
2. Lang right lay
3. Lang left lay
4. Left regular lay

4-41. What type of wire rope is most often used by the Construction Battalions (Seabees) of the Naval Construction Force?

1. 8 strand, consisting of 6, 7, 12, 19, 24, or 37 wires in each strand
2. 6 strand, consisting of 4, 8, 16, 24, or 36 wires in each stand
3. 6 strand, consisting of 6, 7, 12, 19, 24, or 37 wires in each strand
4. 8 strand, consisting of 4, 8, 16, 24, or 36 wires in each strand

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Learning Objective: Identify various factors to consider in selecting a method of measuring wire rope and for computing safe working loads.

4-42. The ability of a wire rope to withstand the compressive and squeezing forces that can distort its cross section when running over sheaves, rollers, and drums is known by what term?

1. Abrasion resistance
2. Fatigue resistance
3. Crushing strength
4. Tensile strength

4-43. The outer wires of each strand of wire rope contribute to the fatigue resistance or abrasion resistance of the wire. This factor makes which of the following service applications correct?

1. Use large wires when high abrasion resistance only is required
2. Use small wires when high abrasion resistance only is required
3. Use large wires when high fatigue resistance only is required
4. Use small wires when both high fatigue and abrasion resistance are required

4-44. The correct way to measure wire is to measure from the top of one strand to the top of the strand directly opposite it.

1. True
2. False

4-45. Compute the safe working (SWL) of a 2-inch wire rope.

1. 6,000 pounds
2. 7,000 pounds
3. 8,000 pounds
4. 9,000 pounds

4-46. Which of the following actions does NOT help to prevent wire rope failure?

1. Checking for overriding or crosswinding of drums
2. Lubricating with heavy-duty grease
3. Inspecting fitting attachments
4. Ensuring correct size, construction, and grade are utilized

Learning Objective: Recognize the fundamentals of wire rope handling.

4-47. In what manner should right and left lay wire rope be coiled down?

1. Both clockwise
2. Both counterclockwise
3. Left lay, clockwise; right lay, counterclockwise
4. Right lay, clockwise; left lay, counterclockwise

4-48. When wire rope or fiber line is received from the manufacturer on a reel, it should be unwound instead of pulled off in bights in order to keep the rope or line from

1. chafing
2. kinking
3. breaking
4. unraveling

4-49. When a loop forms in wire rope and it is pulled into a kink, you should take what action?

1. Uncross the ends and push them apart
2. Cut out the kinked portion
3. Pull it out by stretching one end of the rope
4. Pound it out with a wooden mallet

4-50. In those cases where reverse bends cannot be avoided, you should take what action to help decrease wear and fatigue in wires and strands?

1. Use smaller diameter rope than is ordinarily used
2. Lubricate the rope at more frequent intervals than usual
3. Reduce the space between the blocks and drums being used
4. Use larger blocks and drums than are ordinarily used and space them as far apart as possible

4-51. Sheave diameter should not be less than 20 times the diameter of the wire rope, EXCEPT in the case where wire rope has which of the following properties?

1. An independent core
2. Electroplated wire strands
3. 6 by 37 with a fiber core
4. 6 by 24 with a steel core

4-52. Before cutting wire rope, you should apply a total of how many seizings to each side of the area being cut?

1. One
2. Two
3. Three
4. Four

4-53. When putting on the turns of seizing wire, you use a serving bar or iron to increase the tension on the seizing wire when what conditions exist?

1. The seizing is only temporary, or the diameter of the wire rope is 1/2 inch
2. The seizing is only temporary, or the diameter of the wire rope is 1 inch
3. The seizing is to be permanent, or the diameter of the wire rope is 1 1/2 inches or more
4. The seizing is permanent, or the diameter of the wire rope is 1 5/8 inches or more

4-54. Seizing is placed at intervals from each other that equal what distance?

1. The diameter of the wire rope
2. Twice the diameter of the wire rope
3. Three times the diameter of the wire rope
4. Four times the diameter of the wire rope

4-55. What advantage is gained by cutting back or reversing ends of wire rope connections?

1. The exposure of worn parts
2. The prevention of corrosion on exposed ends
3. An increase in the service life of the rope
4. A change in the tension direction of the rope core

4-56. While inspecting a wire rope, you come across individual wires that are broken and bent back (fishhooks). What situation caused this condition to develop?

1. Damaged drum
2. Incorrect sheave size
3. Reverse and sharp bends
4. Improper fleet angle

4-57. Overloading a rope will decrease its diameter. A rope should be removed from service when its diameter is reduced to what percentage of its original size?

1. 50%
2. 75%
3. 80%
4. 85%

4-58. Of all the protective actions you should take when storing wire rope, which one is of prime importance?

1. Wrap securely in waterproof material
2. Rotate to prevent damage to bottom coils
3. Always place out of direct sunlight
4. Clean and lubricate well

4-59. Fishhooks, kinks, abrasion, and corrosion in wire rope are causes to remove it from service. Wire rope is unsafe when what percentage of the total number of wires within the length of one lay of the rope is broken?

1. 8%
2. 6%
3. 5%
4. 4%

Learning Objective: Identify the techniques used for special attachments for wire rope.

4-60. To make a temporary eye splice with a 1 1/2-inch rope, you need a total of how many wire rope clips?

1. Five
2. Six
3. Three
4. Four

4-61. You have to change the fitting on the end of a wire rope several times during a job and the fitting must bear a heavy load without slipping or failing. What type of fitting meets your needs best?

1. A poured socket
2. A wedge socket
3. A wrapped and mule-tailed socket
4. A spliced fitting

4-62. When making an eye in wire rope with the Nicopress, you are primarily saving what resource?

1. cost
2. Time
3. Labor
4. Material

4-63. A basket socket, fabricated by the dry method, has one sixth of the strength of a poured zinc connection.

1. True
2. False

4-64. Molten lead is used vice zinc for a basket socket. This socket has approximately what fraction of the strength of a zinc connection?

1. One fourth
2. One half
3. Three fourths
4. Seven eighths

ASSIGNMENT 5

Textbook Assignment: "Rigging" and "Reinforcing Steel," pages 5-1 through 6-37.

Learning Objective: Recognize block-and-tackle arrangements used by Steelworkers.

5-1. The most important operation in rigging is safety.

1. True
2. False

5-2. The mechanical advantage of a machine is the amount a machine can multiply the force used to lift or move a load.

1. True
2. False

5-3. What term is used when blocks of a tackle are as close together as they can go?

1. Two-blocked
2. Fall
3. Running block
4. Standing block

5-4. What is a block called when it is attached to an object to be moved?

1. A two-block
2. A fall
3. A running block
4. A standing block

5-5. The "becket" holds the block together and supports the pins.

1. True
2. False

5-6. The "cheeks" are the solid sides of the frame or shell.

1. True
2. False

5-7. A "sheave" is a round grooved wheel over which the line runs.

1. True
2. False

5-8. The "breech" is the opening through which the line passes.

1. True
2. False

5-9. If you wish to rig a tackle using 1/2-inch wire rope, you should select blocks that have a sheave that are of what size, in diameter?

1. 10 inches
2. 14 inches
3. 18 inches
4. 20 inches

5-10. When it is necessary to change the direction of pull on a line, you should use what type of block?

1. Snatch
2. Standard
3. Leading
4. Double

5-11. Adding a snatch block does NOT increase the mechanical advantage, of a tackle system.

1. True
2. False

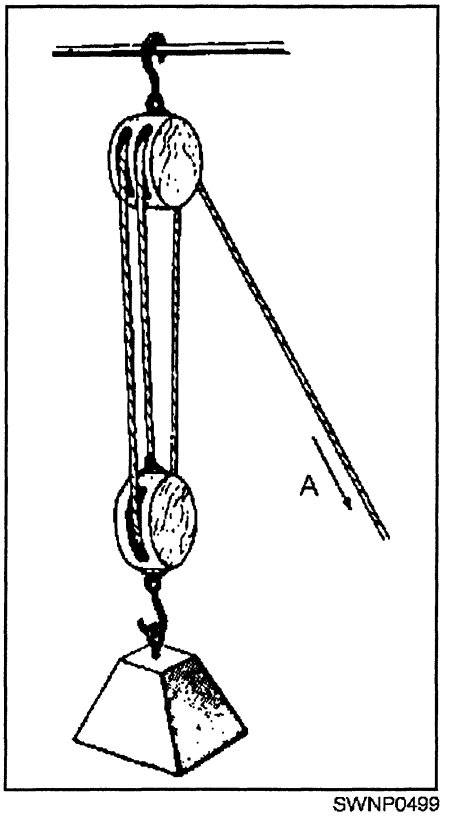

Figure 5A

IN ANSWERING QUESTIONS 5-12 THROUGH 5-14, REFER TO FIGURE 5A.

5-12. In reeving a tackle with the blocks shown in figure 5A, you should first insert the standing end of the fall as shown by what arrow?

1. A
2. B
3. C
4. D

5-13. If the load on the tackle weighs 150 pounds, what force must be applied at arrow A to hoist the load if the effects of friction are not considered?

1. 50 pounds
2. 100 pounds
3. 300 pounds
4. 450 pounds

5-14. If the load is 900 pounds, what total pull must be applied at arrow A to overcome the friction in the blocks and lift the load?

1. 300 pounds
2. 330 pounds
3. 390 pounds
4. 570 pounds

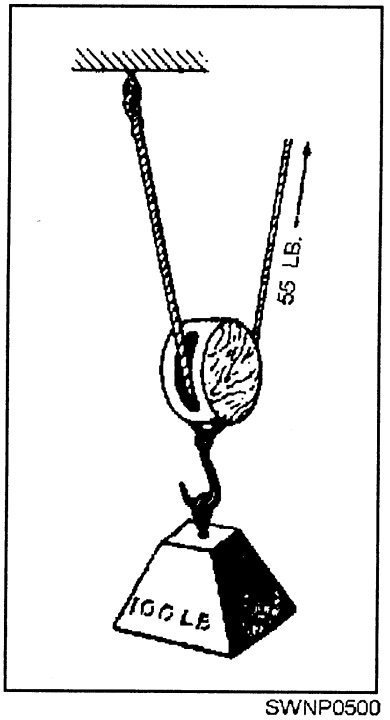

Figure 5B

IN ANSWERING QUESTION 5-15, REFER TO FIGURE 5B.

5-15. What type of tackle is used to lift the weight shown in figure 5B?

1. Single luff tackle
2. Gun tackle
3. Runner
4. Single whip tackle

5-16. In what type of tackle is the running block usually rigged with its sheaves at a right angle to the sheaves of the standing block?

1. A twofold purchase
2. A single luff
3. A double luff
4. A gun

5-17. What is the mechanical advantage of gun tackle when it is inverted?

1. 1
2. 2
3. 3
4. 4

5-18. A threefold purchase is made of two triple sheave blocks and provides a mechanical advantaqe of what value?

1. 4
2. 6
3. 8
4. 10

5-19. Determine the mechanical advantage of a compound tackle using two inverted luff tackles.

1. 8
2. 12
3. 16
4. 20

5-20. When the necessary allowance for friction is made, what is the safe working load (SWL) of a double-luff tackle reeved a with line that has a SWL of 3 tons?

1. 5 tons
2. 10 tons
3. 15 tons
4. 20 tons

Learning Objective: Identify the various means used to lift, move, or support heavy loads.

5-21. What are the primary advantages of wire rope slings?

1. Resiliency and strength
2. Strength and hardness
3. Flexibility and weight
4. Flexibility and strength

5-22. When compared to wire rope slings, fiber line slings offer the advantage of protecting the finished material; however, they are not as strong as wire rope and are easily damaged by sharp edges on material.

1. True
2. False

5-23. Chain slings offer which of the following advantages?

1. Resistance to abrasion
2. Best for slinging hot loads
3. Best for handling loads with sharp edges
4. All of the above

5-24. "Strap" is the term commonly used when referring to what type of sling?

1. Single leg
2. Endless
3. Fiber line
4. Wire rope

5-25. When the weight is evenly distributed among the slings, how many 1/2-inch chain slings will you need to hoist a 5-ton load safely?

1. One
2. Two
3. Three
4. Four

5-26. Why are chain slings less reliable than fiber line or wire rope slings?

1. They have less resistance to stress and strain
2. They have welded links
3. Their links may crystallize and snap without warning
4. They cannot be protected from rust

5-27. When using rope yarn or wire to mouse a hook, you should make how many wraps?

1. 10 to 14
2. 8 to 10
3. 5 t0 7
4. 3 t0 5

5-28. What is the safe working load (SWL) of a 3/4-inch-diameter hook?

1. 500 pounds
2. 750 pounds
3. 1,000 pounds
4. 1,250 pounds

5-29. What is the SWL of a 1/2-inch-diameter shackle?

1. 1,000 pounds
2. 1,250 pounds
3. 1,500 pounds
4. 1,750 pounds

5-30. What is the small platform called that is used to store small lot items that can then be moved as one large item instead of piece by piece?

1. A sling
2. A spreader bar
3. A bridle
4. A pallet

5-31. What jack is used for tightening lines and bracing parts on bridge construction?

1. A ratchet
2. A screw
3. A steamboat
4. A hydraulic

5-32. When making a turn with a load on rollers, you should point the front and rear rollers in what direction?

1. Slightly opposite the direction of the turn
2. The front rollers slightly opposite to the direction of the turn with the rear rollers pointing slightly in the direction of the turn
3. Both slightly in the direction of the turn
4. The front rollers must be slightly, inclined in the direction of the turn with the rear of the rollers in the opposite direction

5-33. Blocking and cribbing are often necessary as a safety measure to keep an object stationary in position. This action can prevent accidental injury to personnel who must work near these heavy objects.

1. True
2. False

Learning Objective: Identify the procedures for the construction, placement, and application of various types of scaffolding.

5-34. What is the maximum length of a swinging platform equipped with reinforcing under rails?

1. 14 feet
2. 18 feet 6 inches
3. 22 feet
4. 24 feet 6 inches

5-35. On a swinging platform, at what distance from the ends of each beam are the stops located?

1. 12 inches
2. 14 inches
3. 16 inches
4. 18 inches

5-36. A boatswain's chair should be used only if no other scaffolding means are not available.

1. True
2. False

5-37. If secured properly, the material used by a crew working on a scaffold can be stored on another scaffold.

1. True
2. False

5-38. Handlines should be used to raise and lower objects from scaffolding when they cannot be reached easily by hand.

1. True
2. False

Learning Objective: Describe the various types of field-erected hoisting devices.

5-39. What is the maximum height limit for an 8-inch-diameter gin pole?

1. 20 feet
2. 30 feet
3. 40 feet
4. 50 feet

5-40. What is the safe capacity of a 40-foot spruce timber gin pole that has a 10-inch diameter?

1. 6,000 pounds
2. 7,000 pounds
3. 8,000 pounds
4. 9,000 pounds

5-41. How long should the guy ropes be for a 15-foot gin pole?

1. 30 feet
2. 45 feet
3. 60 feet
4. 75 feet

5-42. To what depth should the hole be dug for the base of a gin pole?

1. 6 feet
2. 2 feet
3. 3 feet
4. 4 feet

5-43. When a gin pole is being erected, the rear guy line must be kept under tension to prevent the pole from swinging and throwing all of its weight on one of the side guys.

1. True
2. False

5-44. What are the primary advantages of using the tripod over other rigging installations?

1. Load capacity and stability
2. Load capacity and cost
3. No guy lines required and load capacity
4. Stability and no guy lines required

5-45. The strength of a tripod is directly affected by the strength of the rope and the lashings used.

1. True
2. False

5-46. When shears are used to lift heavy loads, the length to diameter (L/D) ratio should not exceed what number?

1. 40
2. 50
3. 60
4. 70

5-47. What is the maximum allowable drift (inclination), in degrees, for shears?

1. 30
2. 35
3. 40
4. 45

5-48. When shears are erected, the spread of the legs should equal what length?

1. One fifth of the length of the legs
2. One fourth of the length of the legs
3. One third of the length of the legs
4. One half of the length of the legs

Learning Objective: Identify the purpose, types, and uses of reinforcing steel in concrete.

5-49. What is the primary factor that determines the strength of concrete?

i. Dryness
2. Water-to-cement ratio
3. Age
4. Type of steel reinforcement

5-50. Concrete is strong in tension but weak in compression.

1. True
2. False

5-51. Which of the following factors make steel the best material for reinforcing concrete?

1. Steel adds compressive strength
2. The expansion properties of both steel and concrete are approximately the same
3. Steel is easily bent to fit all shapes of forms
4. Steel adheres well to concrete

5-52. What type of surface condition on rebar provides the best adherence with concrete?

1. Clean and smooth
2. Loose or scaly rust
3. Painted
4. Light firm layer of rust

5-53. On what part of rebar are diameter measurements taken?

1. The round/square where there are no deformations
2. Across the deformations where the diameter is greatest
3. The diagonal of its widest section
4. The diameter of the deformation plus the height of the deformation

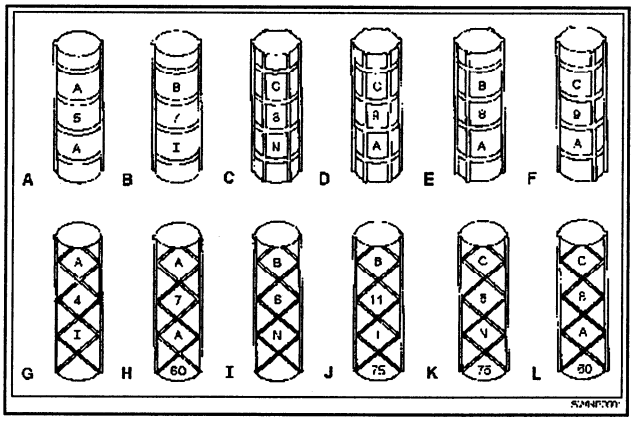

Figure 5C

IN ANSWERING QUESTIONS 5-54 THROUGH 5-56, REFER TO FIGURE 5C.

5-54. The identifying marks of bar D indicate what grade of rebar?

1. 40,000 psi
2. 50,000 psi
3. 60,000 psi
4. 75,000 psi

5-55. What types of rebar are equal in size, type, and grade in both bar-branding systems?

1. E and L
2. D and F
3. B and J
4. A and F

5-56. What types of rebar are rolled axle steel?

1. A, D, F, L
2. B, C, G, K
3. C, E, N, A
4. H, I, J, K

5-57. When the number designation 8x8x1Ox1O is used, what do these numbers indicate about a roll of wire mesh?

1. The wire gauge is 8 and the crosswise spacing is 10 inches
2. The wire gauge is 10 and crosswise and lengthwise spacing is 8 inches
3. The wire gauge is 8 and the length spacing is 8 inches
4. The crosswise spacing is 10 inches and the wire gauge is 10

Learning Objective: Identify the fundamentals of bending, tying, and placing reinforcing bars.

5-58. What size pin diameter is required when a bend is made on a #9 bar?

1. 8 1/2 inches
2. 9 inches
3. 11 1/4 inches
4. 18 inches

QUESTIONS 5-59 THROUGH 5-62 CONCERN THE HYDRAULIC IRONMASTER ROD BENDER.

5-59. What is the maximum capacity for cold working rebar?

1. #7
2. #9
3. #10
4. #11

5-60. The bend angle which is set on the control rod is graduated into (a) what range of degrees at (b) what intervals?

1. (a) 10° to 360° (b) 10°
2. (a) 5° to 180° (b) 10°
3. (a) 5° to 190° (b) 5°
4. (a) 5° to 180° (b) 5°

5-61. What is the purpose of the shearing support?

1. To prevent the bars from kicking up during shearing operations
2. To prevent the breaking of bars after bending past 190 degrees
3. To allow the table to back off slightly after bending
4. To disengage the bending cylinder and return the rack to neutral

5-62. A bar marked 1 B0409 is to be bent into a 180-degree S-shape that is considered a standard bend. What is the minimum diameter of the pin around which the bar can be bent?

1. 8 inches
2. 2 inches
3. 3 inches
4. 4 inches

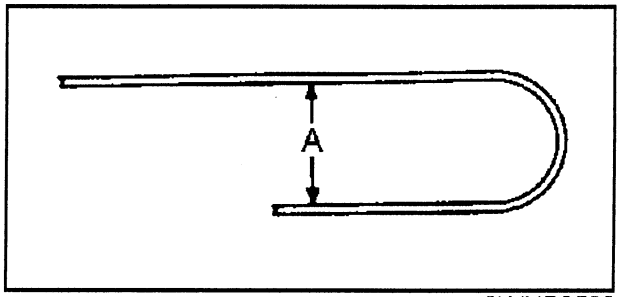

FIGURE 5D

IN ANSWERING QUESTION 5-63, REFER TO FIGURE 5D.

5-63. In checking the building plans, you notice that six rebars marked 3C0205 are to be bent with standard 180-degree hooks at one end. Distance A should equal

1. 1 1/2 inches
2. 2 1/2 inches
3. 3 1/2 inches
4. 4 inches

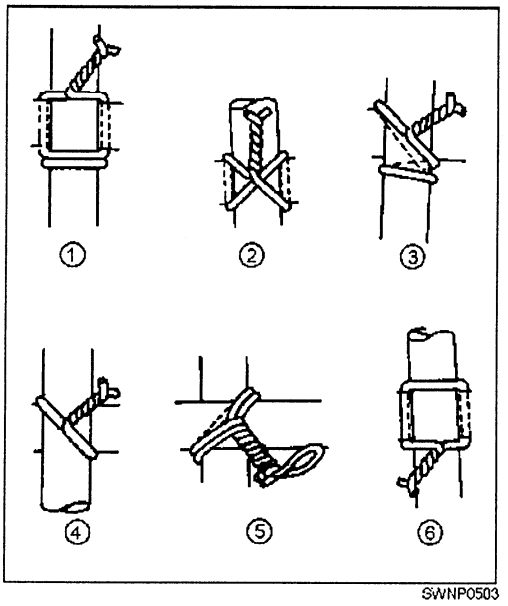

Figure 5E

IN ANSWERING QUESTIONS 5-64 THROUGH 5-66, REFER TO FIGURE 5E.

5-64. What tie is most often used in floor slabs?

1. 6
2. 2
3. 3
4. 4

5-65. What type is tie #l?

1. Double-strand single strand
2. Saddle tie with a twist
3. Figure eight tie
4. Saddle tie

5-66. What tie will cause the LEAST amount of twisting action on rebar?

1. 5
2. 2
3. 3
4. 4

5-67. In concrete, proper coverage of the bars is required to prevent what condition(s) from developing?

1. Fire, weather, and corrosion damage
2. Bars expanding and breaking through the concrete
3. Rust seeping to the surface of the concrete
4. Loss of tensile strength in the bars

5-68. In footings between the ground and steel, what minimum thickness of concrete should be provided?

1. 6 inches
2. 8 inches
3. 3 inches
4. 4 inches

5-69. When splicing 1/2-inch-thick rebar of reinforcing steel without the benefit of drawing specifications, what is the minimum distance that you should lap the bar?

1. 12 inches
2. 15 inches
3. 20 inches
4. 25 inches

5-70. When a column assembly of rebar is raised into place, the reinforcing steel is tied to the column form at intervals of what distance?

1. 5 feet
2. 2 feet
3. 3 feet
4. 4 feet

ASSIGNMENT 6

Textbook Assignment: "Pre-engineered Buildings, K-spans, Towers, and Antennas" and "Pre-engineered Storage Tanks," pages 8-1 through 9-13.

Learning Objective: Identify the construction characteristics of pre-engineered metal structures and procedures for erection and disassembly.

6-1. What is the true length of a pre-engineered building (P.E.B.) that consists of four bays?

1. 40 feet 6 inches
2. 60 feet 6 inches
3. 80 feet 6 inches
4. 90 feet 6 inches

6-2. There are a total of how many intermediate frames in a P.E.B. that is 100 feet long?

1. Nine
2. Eight
3. Six
4. Four

6-3. What is the most important step in pre-erection work that increases the ease of erecting a P.E.B.?

1. Earthwork placement
2. Forms placement
3. Concrete placement
4. Anchor bolt placement

6-4. At what location is the erection manual and a set of drawings for a P.E.B. to be erected and maintained?

1. With the plans and specifications
2. In the battalion tech library
3. In the small parts box (Box 1)
4. At the quality control office

6-5. You are ready to begin the erection of a P.E.B. at a selected site. At what location(s) should the girts, purlins, cave struts, and brace rods be staged?

1. In the center of the site
2. At each end of the site
3. At the designated locations around the site where they will be used
4. Only at one end of the site

6-6. After all foundation work is completed and cleaned off, the base shoes are bolted in place. What component(s) is/are laid out next?

1. The doors only
2. The assembled columns and roof beams
3. The girts only
4. The purlins and struts

6-7. When a gin pole is being used to raise the end frame of a P.E.B., what action should you take to prevent distortion of the frame as it is being raised into place?

1. A driftpin should be dropped into the frame
2. A block should be mounted to the top of the gin pole
3. A tag line should be attached to the frame
4. A bridle should be attached securely on each side of the frame below the splice connection and to the ridge of the roof beam

6-8. A gin pole is being used to raise an end frame of a P.E.B. What action can the tagman take to maintain control of the frame if it moves beyond the vertical position?

1. Keep the line taut
2. Allow some slack in the line
3. Keep the frame in balance just beyond the vertical position
4. Take a few turns of the tag line around the bumper of a truck previously positioned for this purpose

6-9. How do you determine whether the erected columns of the frame for a P.E.B. are plumb and square?

1. By checking each corner with a carpenter's level
2. By checking each corner with a carpenter's square
3. By checking the horizontal distance from the upper corner of one frame to the upper corner of the adjacent frame
4. By checking the diagonal distance from the upper corner of one frame to the lower corner of the adjacent frame

6-10. When should a construction team install the cave struts, girts, and purlins in the bays of a P.E.B.?

1. After the building is completed
2. After all the frames are erected
3. As soon as each frame is erected
4. As soon as the diagonal brace rods are installed

6-11. When the base angles are installed, you can take what action that will permit adjustments after the wall sheeting has been applied?

1. Bolt the base angles in place
2. Sweep the concrete foundation
3. Place a flat steel washer under each nut
4. Leave the nuts loose

6-12. Helix nails or sheet-metal screws are recommended for attaching what type of P.E.B. insulation material to the building?

1. Hardboard insulation that is applied directly to the inside surface of the structural
2. Blanket-type insulation installed between the sheets and structural
3. Hardboard secured to wood framing
4. Sheet board to the outside frame

6-13. When disassembling a P.E.B., you remove what structural member first?

1. Windows
2. Doors
3. Sheeting
4. Purl ins

6-14. After the sheeting has been removed from a P.E.B., you can proceed to disassemble the building by removing what parts first?

1. Frames
2. Girts and purlins
3. Windows, doors, and end walls
4. Diagonal brace angles and sag rods

Learning Objective: Identify erecting procedures for K-span buildings (ABM 120).

6-15. The K-span building machine turns coils of steel into structural strength arched panels which are machine seamed together. This process eliminates the need for nuts, bolts, or other types of fasteners.

1. True
2. False

6-16. The machine operator does NOT control which of the following functions?

1. The running of the stock through to form the panel shape
2. The cutting of the stock to the correct length
3. The selection of the site location
4. Putting the arch in the panel

6-17. Concrete forms and accessories are provided for a K-span building of what size?

1. 100 feet long by 50 feet wide
2. 100 feet long by 40 feet wide
3. 80 feet long by 50 feet wide
4. 80 feet long by 40 feet wide

6-18. All material for the forms is provided for with the exception of

1. stakes
2. side form panels
3. end wall caps
4. cross pipes

6-19. Why is attaching the spreader bar a critical step in erecting panels?

1. A loose clamp can cause panels to slip and fall, resulting in injury to personnel and damage to the panel
2. A loose clamp can cause damage to the crane
3. Guide ropes are not required with a spreader bar
4. It allows panels to be placed in high winds

6-20. It is not necessary to seam each set of standing panels before detaching the spreader bar.

1. True
2. False

6-21. How many inches “on center” do you weld the panels to the attaching angle?

1. 8
2. 10
3. 12
4. 14

6-22. Which of the following building characteristics determine the foundation design of a K-span?

1. Wind load only
2. Building size only
3. Soil conditions only
4. Each of the above

6-23. Where are the actual footing details for a K-span building located?

1. In the erection manual
2. In the plans and specifications
3. In the blueprints
4. In the construction drawings

6-24. When do you install the end wall attaching angle?

1. After the first three panels are set
2. When the exact building length has been determined
3. After the first set of panels is set
4. After all panels are set

6-25. How many inches is the top exterior portion of the concrete sloped after all of the panels are welded to the attaching angle?

1. 6
2. 5
3. 3
4. 4

6-26. The Super Span (ABM 240) uses heavier coil stock, has a larger minimum and maximum span, and has a panel profile than that used for the K-span building (ABM 120) .

1. True
2. False

6-27. Although there are some differences between the ABM 120 and the ABM 240, the actual construction steps are the same for both buildings.

1. True
2. False

Learning Objective: Identify erecting and dismantling procedures for prefabricated steel towers.

6-28. What is the correct method for assembling a side of the first section of a tower?

1. Each leg is connected to the foundation stub
2. Two legs are connected to the foundation stub, then the angle and cross braces are joined
3. Two legs are connected to the foundation stubs, the angle and braces are joined, and the side is then erected as a unit
4. The whole section is assembled and fitted to the foundation stubs , and then connected

6-29. How are the bolts used in assembling a steel tower locked in place after the tower has been completed?

1. They are tightened with locknuts
2. They are center punched
3. They are countersunk
4. They are fitted with lock washers

6-30. When dismantling a tower, you should insert the fiber line in the snatch block after what steps have been accomplished?

1. The securing of one end of the tag line to one end of the bowline
2. The securing of the snatch block to the base of the tower
3. The lining up of the snatch block with the power source
4. The attaching of a shackle to the gusset plate and hanging a snatch block in the shackle

6-31. To remove the legs of a tower section, you remove the first gusset plate to accomplish what action?

1. The securing of the tag line with a clove hitch
2. The cutting out of all of the rivets that hold the leg
3. The taking up of the slack in the hoist line
4. The tightening of the two inserted machine bolts

6-32. You are dismantling the leg of a tower structure section that has served as a gin pole in the dismantling operation. You should remove the top machine bolt and loosen the other machine bolt one-quarter turn before taking what action?

1. Cutting the remaining rivets from the leg
2. Signaling the vehicle operator to back up slowly
3. Removing the gusset plate from one side of the splice
4. Signaling the crew to remove the hoist line from the base snatch block

6-33. How is an untapered antenna tower made structurally stable?

1. By guy wires attached to ground anchors
2. By external braces fastened to the base of the tower
3. By use of oversized base supports
4. By use of a composite base or foundation

6-34. What type of antenna tower requires a composite base?

1. Heavy construction
2. Guyed, light construction
3. Pivot type, light construction
4. Tapered, light construction

6-35. When level, the supports for an antenna tower can help keep sections of the tower from twisting.

1. True
2. False

6-36. You are fastening parts of an antenna tower with high strength steel bolts that are 3/4 inch by 10 inches in size. What is the maximum torque that you should apply to tighten the bolts?

1. 105 foot-pounds
2. 205 foot-pounds
3. 370 foot-pounds
4. 490 foot-pounds

6-37. Refer to textbook figure 8-33 which shows a davit hoist used for erecting a lightweight guyed tower. Why is a snatch block attached to the tower base?

1. To maintain a fixed distance between the hoisting line and the upper end of the davit
2. To help tower sections being hoisted from touching sections already in place
3. To direct the hoisting line to a winch
4. To fasten the tower base to the concrete foundation

6-38. How is a lightweight, pivoted 120-foot tower raised with a gin pole?

1. By a hoisting line attached to a single point near the tower top
2. By a snatch block and hoisting sling attached to the tower at two points
3. By a snatch block and tag line attached to the tower base
4. By a snatch block attached at the top of the tower

6-39. At least how many sections of a tower are erected before temporary guying becomes necessary?

1. One
2. Two
3. Three
4. Four

6-40. For a 200-foot tower with two guy layers, cable attachments should be positioned at approximately what levels?

1. The 60- and 100-foot levels
2. The 60- and 160-foot levels
3. The 160- and 200-foot levels
4. The 100- and 200-foot levels

6-41. When the guy tension is not specified in the tower installation plans, the tension is adjusted at first to what percentage of the breaking strength of the guy strand?

1. 10%
2. 20%
3. 30%
4. 40%

6-42. After an antenna tower is erected and plumbed, you should test the tension of how many of its guy lines with a dynamometer?

1. One guy in each direction of pull
2. One guy only at each level to which guys are clamped
3. The uppermost guys only
4. All of the guys

Learning Objective: Identify the principles and methods of assembling and erecting pre-fabricated bolted steel tanks.

6-43. What size bolted steel tank will you need to store 10,000 gallons of water?

1. A 1.00 barrel tank
2. A 250 barrel tank
3. A 500 barrel tank
4. A 900 barrel tank

6-44. What size earth pad is required for a tank with an outside diameter of 15 feet 5 inches?

1. 15 feet 5 inches
2. 16 feet 5 inches
3. 17 feet 5 inches
4. 18 feet 5 inches

6-45. What advantage is gained from the spreading of a layer of clean sand or gravel over the foundation for a tank ?

1. Good drainage is ensured
2. Corrosion is prevented
3. Oxidation is increased
4. Erosion is prevented

6-46. The two bottom plates of a 100 barrel tank are what shape?

1. Wedge
2. Semicircular
3. Circular
4. Square

6-47. What part of the tank erection kit do you use to make the tank deck slope properly?

1. A bolt retainer angle
2. A flanged manhole
3. A top chime
4. The center ladder

6-48. What part of the deck section acts as a supporting rafter for the top of the tank?

1. The center ladder support
2. The flanged side
3. The radial seam joint
4. The bolt retainer angle

6-49. What is the total capacity, in gallons, of a 250 barrel tank?

1. 4,500
2. 5,350
3. 10,500
4. 21,000

6-50. The bottom of what size tank consists of 14 wedge-shaped plates that connect to a one-piece center-ring section?

1. 100 barrel
2. 250 barrel
3. 500 barrel
4. 900 barrel

6-51. After the bottom plates of a 250 or 500 barrel tank have been installed, their pattern should resemble what shape?

1. A triangle
2. A rectangle
3. A wheel
4. A trapezoid

6-52. What characteristic should the ends of gasket material that you have broken or cut exhibit to ensure a leakproof joint?

1. They should overlap at least two bolt holes and be squarely across the second hole
2. They should be cut squarely and bolted close together over two bolt holes
3. They should be laid over each other in a crosswise fashion
4. They should extend at least one bolt hole and be folded back under the cutoff piece

6-53. After the first intermediate plate has been installed on the bottom of a 500 barrel tank, the remaining plates are installed in a counterclockwise direction.

1. True
2. False

6-54. What is the reason that all catch nuts for the bolts on the bottom plates of a tank should be finger-tightened only?

1. So each plate can be adjusted to allow the last plate to fit
2. So the wedge gussets fit under
3. So caulking can be applied under all gaskets
4. So the gaskets are not damaged during assembly

6-55. At what point during construction should the center support ladder components and manhole dome be placed inside the tank?

1. Just before the bottom bolts are tightened
2. Just before the last stave is installed
3. Just after the deck has been installed
4. Just after sealing compound has been applied to all bottom seams

6-56. To determine which end of a stave is the top, you look at the stave from the outside while it is in the vertical position. If the stave is in the proper position, offsets are at what corners?

1. Upper right and lower left
2. Lower right and upper left
3. Lower left and upper left
4. Upper right and upper left

6-57. The special stave, fitted with a pipe coupling of the same size as the tank supply pipe, must be the first stave to be installed.

1. True
2. False

6-58. Of the 14 deck plates used for the 500 barrel tank, 2 are fitted with what components?

1. Liquid level indicators
2. A tank thief and vent
3. Cross-braced flanges
4. Left-side lap seams

6-59. As the deck plates are being installed, you find that the ends of some of them will not align with the bolt holes on the manhole or the top chime bolts. What action should you take to eliminate this problem?

1. Cut the short end around the manhole with a torch
2. Raise or lower the center support ladder until all deck section bolt holes are aligned
3. Raise the outside or top chime section and pull the vertical staves out or in as required
4. Increase the size of the holes by drilling

6-60. If a tank is to used for other than water storage, the emergency vent valve can be omitted.

1. True
2. False

6-61. The outside ladder assembly of a 500 barrel tank has how many steps?

1. Five
2. Seven
3. Eight
4. Nine

ASSIGNMENT 7

Textbook Assignment: "Pontoons" and "Pre-engineered Structures: Short Airfield for Tactical Support," pages 10-2 through 11-27.

Learning Objective: Identify the design and construction features of P-series pontoons and attachments.

7-1. What types of pontoons are used to form a continuous ramp for causeway ends and barge bows?

1. P1 and P2
2. P3 and P4
3. P1 and P3
4. P2 and P4

7-2. What pontoon number does a P2 become when quick-lock connectors are fixed to-its bow?

1. P5
2. P2
3. P3
4. P4

7-3. A 4 by 12 pontoon assembly consists of

1. 4 pontoons, each 12 feet square
2. several 4-foot by 12-foot pontoons
3. 4 pontoon strings in width and 12 pontoons long
4. 4 pontoon strings, each 12 feet long

7-4. Assembly angles E16L and E26R are designed to be used

1. as basic condition angles on the edges of the pontoon strings
2. as basic condition angles anywhere on the pontoon strings
3. as end condition angles on left and right edges, respectively, of the pontoon strings
4. as basic condition angles only to be used on topside of the continuous angles

7-5. What device is used to prevent an A6 assembly bolt from working out of assembly angles?

1. A cotter pin
2. Keeper plates
3. Flanged nuts
4. Links

7-6. What accessory is used for connecting pontoon strings at the point where each string has a P3 sloped-deck ramp pontoon connected to a P1 pontoon?

1. AP8 ramp-end bent plate
2. AP7 gusset plate
3. AP6 chafing plate
4. AP5 end plate

7-7. When installing RF1 rubber fenders, you use the RF4 fender bracket for what purpose?

1. Horizontal fender connections
2. Corner installations
3. Drop fender installations
4. Diagonal fender installations

7-8. The H6 hatch cover and floor panel assembly are primarily used to convert what type of pontoon into a storage compartment?

1. P1
2. P2
3. P5M
4. P4

7-9. The DC6 deck closure is used

1. to bridge openings or slots between pontoons
2. to bridge the space between adjacent causeway sections being set up
3. to make a bridge to wharf connection
4. to make a barge to wharf connection

7-10. What bitt is desiqned for quick positioning in the chain plate of a causeway section?

1. The B1 all-purpose bitt
2. The MI147 double bitt
3. The B4 retractable bitt
4. The LK12 utility bitt

Learning Objective: Identify the fundamentals of assembling pontoons to form a string, launching the string, and joining launched strings to form barges and causeways.

7-11. At what location should you position the first and succeeding pontoons after the first two assembly angles are installed in a causeway section?

1. The first pontoon is placed in the center of the angle and succeeding pontoons on each side of the first one
2. The first pontoon is placed on the bow and succeeding pontoons on the stern, working forward
3. The first pontoon is placed on the bow, the second on the stern, the third on the bow, and the fourth on the stern
4. The first pontoon is placed on the stern then succeeding pontoons work outward and forward

7-12. In which of the following ways are A6B bolts used in the construction of pontoon systems?

1. To connect strings into structures
2. To secure assembly angles to pontoons at each corner
3. To secure deck fittings and accessories
4. All of the above

7-13. After being launched, what special tool is used to clamp together a series of pontoon strings?

1. JT7 drive wrench
2. JT8 backup wrench
3. JT13 two-piece aligning tool
4. JT2 top angle clamp

7-14. The JT13 aligning tool should be used when the differences in the hole alignment between angles restrict easy passage of A6B bolts.

1. True
2. False

7-15. What pontoon barge was designed for mounting a crawler crane?

1. The 3 by 12
2. The 4 by 12
3. The 5 by 12
4. The 6 by 18

7-16. What is the primary use of the 10 by 30 barge?

1. As a 1,500 barrel fuel storage tank
2. As a mount for a 100-ton derrick
3. As a heavy-duty wharf structure
4. As a warping tug

7-17. A pontoon causeway consists of what sections?

1. One inshore and one offshore with as many intermediate sections as required for length
2. One inshore, one intermediate, and two offshore
3. Two inshore, two offshore, and two intermediate
4. One inshore and two offshore

7-18. What types of pontoons make up an inshore section of a causeway?

1. P1, P5M, and P4
2. P1, P2, P3, and P4
3. P1, P5F, and P5M
4. P1, P3, P4, and P5M

7-19. Causeway sections are normally deployed on what type of ship?

1. LSD
2. LCM
3. LST
4. LPD

7-20. To submerge the decks of a dry dock to its maximum depth of 12 feet, you need a sheltered area with a smooth bottom with how many feet of quiet water?

1. 12 to 14
2. 18 to 20
3. 22 to 24
4. 24 to 26

7-21. What type(s) of pontoons are used to form dry docks?

1. P1 and P5M
2. P1, P2, and P3
3. P1 only
4. P4 only

Learning Objective: Identify the design, use, and features of the Elevated Causeway Sections (ELCAS).

7-22. The ELCAS is used to bridge the surf zone.

1. True
2. False

7-23. A standard ELCAS consists of three 3 by 15 approach/roadway sections and

1. nine 3 by 15 pierhead sections
2. six 3 by 15 pierhead sections
3. three 3 by 15 pierhead sections
4. four 3 by 15 pierhead sections

7-24. What unique component of the ELCAS system gives it the ability to elevate?

1. P1 pontoons
2. Supporting pilings
3. Spudwells
4. 3 by 15 intermediate causeway sections

7-25. Internal spudwells are used in the inboard string of pierhead sections.

1. True
2. False

7-26. The ELCAS consists of a total of how many parts?

1. Eight
2. Six
3. Three
4. Four

7-27. How many spudwells are required to construct a type 3 pierhead section?

1. Three internal and four external
2. Four internal and four external
3. Four internal and three external
4. Three internal and three external

7-28. The fender system uses P8 pontoons as end-to-end connections instead of P5 pontoons since it is only one pontoon wide.

1. True
2. False

Learning Objective: Identify the construction features and functions of the major components of the Short Airfield for Tactical Support (SATS).

7-29. AM-2 matting is manufactured from what type of metal?

1. Steel
2. Aluminum
3. Iron
4. Copper

7-30. Why are AM-2 mats installed with their joints staggered in a brickwork fashion?

1. To stabilize the runway across its width and in the direction of aircraft travel
2. To stabilize the runway across its width and to make it flexible in the direction of aircraft travel
3. To make the runway flexible across its width and to stabilize it in the direction of aircraft travel
4. To make the runway flexible across its width and in the direction of aircraft travel

7-31. What are the contents of one full pallet assembly of AM-2 matting?

1. 11 half mats, 2 full mats, and 2 locking bars
2. 2 half mats, 11 full mats, and 2 locking bars
3. 4 half mats, 8 full mats, and 12 locking bars
4. 2 half mats, 11 full mats, and 13 locking bars

7-32. What does one F15 pallet assembly of AM-2 matting contain?

1. 2 half mats, 4 full mats, and 10 locking bars
2. 2 half mats, 8 full mats, and 20 locking bars
3. 4 half mats, 20 full mats, and 24 locking bars
4. 4 half mats, 16 full mats, and 20 locking bars

7-33. The standard pallet assembly (F11) provides a width of two rows (4 feet) on a runway or taxiway that is how many feet wide?

1. 54
2. 72
3. 69
4. 99

Learning Objective: Recognize the general principles and procedures for installing AM-2 runway mats.

7-34. When a SATS site for placement of AM-2 mats is being prepared, the surface must be leveled and graded so that over a span of 12 feet, the maximum variation in height of the mats is

1. 1 inch
2. 3/4 inch
3. 1/2 inch
4. 1/4 inch

7-35. For which of the following reasons should accurate longitudinal and transverse center lines be established before a SATS installation?

1. To ensure there is enough room for the airfield
2. To ensure that the site meets CBR requirements
3. To make the deployment of pallets easier
4. All of the above

7-36. What equipment is best suited for handling pallets of AM-2 airfield matting?

1. A motorized rough-terrain crane
2. A helicopter
3. A 4K forklift
4. A 6,000-pound rough-terrain forklift

7-37. In addition to the POIC, the typical installation crew assigned to lay a 96-foot-wide runway consists of what personnel?

1. 1 alignment man, 12 mat installation men, and 2 pry bar men
2. 2 alignment men, 12 mat installation men, and 2 pry bar men
3. 2 alignment men, 24 mat installation men, and 2 pry bar men
4. 2 alignment men, 12 mat installation men, and 4 pry bar men

7-38. The pry bar men of the installation crew are responsible for which of the following tasks?

1. Adjusting the first mat in each transverse row
2. Spacing the mats to allow for thermal installation and insertion of the mat-locking bars
3. Taking the mats from a pallet and installing them in place
4. All of the above

7-39. What is used as the starting point for laying runway mats in an installation not requiring a guide rail system?

1. The approach apron
2. The transverse center line
3. The longitudinal center line
4. The end opposite the approach apron

7-40. In an installation requiring a guide rail system, starter keylocks are used for laying runway mats.

1. True
2. False

7-41. To guide the crew in the installation of the AM-2 matting, you should install keylocks every 100 feet.

1. True
2. False

7-42. What action, if any, is recommended to prevent a seesaw force from disturbing the alignment of the matting when a keylock section is placed and aligned at the center line?

1. Lay several transverse rows of matting initially in opposite directions
2. Initially lay several transverse rows of matting in one direction only
3. Lay several longitudinal rows of matting in one direction
4. None

7-43. When AM-2 mats are being installed, the installers can prevent misalignment due to the “loose fit” design by taking what action?

1. Using locking bars as temporary spacers between the rows
2. Installing rubber spacers between the longitudinal rows
3. Installing rubber spacers between the transverse rows
4. Installing gap gauges between the transverse rows

7-44. What devices are used to secure typical 9-foot and 12-foot keylocks together?

1. Male-female edges
2. Locking bars
3. Socket head screws
4. Binding straps

7-45. On what type of surface should mat ends be laid?

1. Crushed rock
2. Concrete
3. Packed dirt
4. Sand

7-46. At what depth should the free end of the approach apron be buried?

1. Between 12 to 16 inches
2. Between 16 to 18 inches
3. Between 18 to 24 inches
4. Between 24 to 26 inches

7-47. When guide rails and mats are being laid, any depression in the grade that is not within specifications can be disregarded.

1. True
2. False

7-48. What total number of gap gauges should remain installed after the guide rail pins have been installed?

1. 10
2. 2
3. 5
4. 4

7-49. To speed up the installation of AM-2 mats, you should assume that no two parts are laid at the same time. For the field-laying procedure, what is the order of sequence of installation, first to last?

1. Lateral taxiway, main runway, parallel taxiway, and parking areas
2. Main runway, parallel taxiway, parking areas, and lateral taxiways
3. Main runway, lateral taxiways, parallel taxiways, and parking and storage areas
4. Lateral taxiway, parallel taxiway, main runway, and parking and storage areas

7-50. As described in the text for taxiway procedure #2, the space between the taxiway and the runway should fall within what size range, in inches?

1. 1 to 2
2. 2 to 3
3. 3 to 4
4. 4 to 5

7-51. Parking and storage areas may be laid with leftover mats in any random pattern.

1. True
2. False

Learning Objective: Identify the procedures for repairing damaged matting and for disassembling and removing the matting from the runway.

7-52. When cutting out a damaged AM-2 mat, you should make a cut along (a) what edge and (b) what connector?

1. (a) Female (b) prongs-up
2. (a) Male (b) prongs-down
3. (a) Female (b) prongs-down
4. (a) Male (b) prongs-up

7-53. In the lower adapter, the dowel pin functions as (1) a locating device in the placement of the upper and middle adapters on the lower adapter, and (2) a means of keeping the holes in the upper, middle, lower, and connector adapters in approximate alignment.

1. True
2. False

7-54. What action is taken to lock in place the locking bar of the replacement mat shown in figure 11-34 of the textbook?

1. The attachment of a clamp over the male connector
2. The bottoming of the setscrew
3. The tightening of the socket head screws
4. The insertion of the dowel pins

7-55. A section of SATS runway must be replaced. To remove the typical keylock section, you should ensure what step is taken first?

1. Pry the keylock out halfway
2. Insert the keylock removal tool
3. Remove the socket head screw
4. Loosen the socket

7-56. When replacing a SATS runway section, you remove the initial 3-foot and 6-foot keylock section by

1. hammering it out with a sledge
2. prying it with a bar
3. pulling it with a keylock removal tool
4. cutting it with a portable saw

7-57. The first row of runway mats can be disassembled and removed by lifting the entire row evenly with lifting blocks and pry bars and by pulling out the locking bars.

1. True
2. False

7-58. In the procedure for replacing damaged mats with new or refurbished mats, the last row of matting is raised in unison for what purpose?

1. To level the ground surface
2. To attach end connectors
3. To insert locking bars
4. To install the guard rail

7-59. What material should be used to reinforce filled cavities under AM-2 matting?

1. Dry sand
2. Crushed rock
3. Damaged AM-2 mats
4. Restored AM-2 mats

7-60. In which of the following ways should you position mats-so their edges can be straightened with the edge repair tool?

1. To give the tool clearance, place them on blocks that have the height to do this
2. When straightening male edges, place the tops of the mats face up
3. When straightening lower and upper female edges, place the bottoms of the mats face up
4. All of the above

7-61. What components do you remove last when using the most efficient procedure for disassembling a SATS runway (no guide rail)?

1. Typical keylocks
2. Female keylocks
3. Starter keylocks
4. Starter locking bars

7-62. When disassembling a guide rail equipped SATS runway, you should start removing mats from the end of the runway that was assembled last.

1. True
2. False

ASSIGNMENT 8

Textbook Assignment: "Steelworker Tools and Equipment," pages 12-1 through 12-15.

Learning Objective: Describe the principles and techniques for operating and maintaining tools used by Steelworkers in the shop and field.

8-1. Work that does not require great accuracy and is accomplished on a bench or pedestal grinder is known as what type of grinding?

1. Free hand
2. Precision
3. Off hand
4. Offset

8-2. What advantage is gained by flooding the wheel on a wet type of grinder?

1. The wheel will not become brittle
2. The chips and cracks are made easy to find
3. Fire hazards are totally eliminated
4. The wheel and work are kept cool and clean

8-3. Tool rests on a grinder must always be used and properly adjusted to prevent what problem from occurring?

1. Work becoming wedged between the rest and the wheel
2. Fingers being caught in the wheel
3. Clothing getting caught in the wheel
4. Sparks and dust obscuring the view of the work

8-4. Grinding wheels can be sources of danger and must be checked periodically for irregularities and soundness. To test the wheel, you suspend it on a string or wire and tap it with a metal rod. A solid wheel gives off a clear ringing sound.

1. True
2. False

8-5. When using a wheel dresser, you should never take which of the following actions?

1. Remove the glaze from the wheel
2. True the wheel
3. Put the flat surfaces on the sides of the wheel
4. Bring the wheel back to round

8-6. Because doing so will clog the wheel, you should never shape which of the following metals on an abrasive wheel?

1. Gray cast iron
2. High carbon steel
3. Aluminum
4. Tungsten

8-7. Which of the following actions should you take before using a pneumatic tool?

1. Inspect the air hose for leaks or damage
2. Blow air through the air hose to free it of foreign material before connecting it to the tool
3. Keep the air hose clean and free of lubricants
4. All of the above

8-8. Compressed air comes directly in contact with valves and pistons in pneumatic hammers and causes which of the following conditions to occur?

1. Rust formations in the valves
2. Lubricants evaporate from the system
3* Lubricants are driven out of the exhaust
4. Lubricants become contaminated with moisture

8-9. Which of the following steps must be taken when working continuously with a pneumatic tool on a compressed air system not equipped with a filter, a regulator, and a lubricator assembly?

1. Stop hourly, disconnect the hose, and squirt a few drops of heavy oil into the hose connection
2. Stop twice daily, disconnect the hose, and squirt a few drops of light oil into the hose connection
3. Every morning before starting, squirt as much oil as you can into the hose connection
4. Disconnect the hose every hour or so and squirt a few drops of light oil into the hose connection

8-10. What lubricant must be used to clean a pneumatic tool that has become gummed up and dirty from heavy oil?

1. Kerosene
2. Cleaning solvent
3. Gasoline
4. Diesel fuel

8-11. What other task does the combination iron worker perform in addition to shearing, coping, notching, and mitering?

1. Straightening bends
2. Punching holes
3. Cutting circles
4. Bending rebar

8-12. The maximum capacity of a material that can be safely handled by a combination iron worker is found at what location?

1. On the supervisor’s checklist
2. At designated sites
3. On the capacity plate
4. On the material handling cards

8-13. The vertical band saw is primarily used to make curved cuts; however, it is frequently used for what other type of cutting?

1. Design
2. Off hand
3. Machine
4. Straight

8-14. On a band saw, the mechanism that adjusts and controls the alignment and tensioning of the blade is at what location?

1. On the blade guides
2. On the lower wheels
3. On the upper wheels
4. On the worktable

8-15. What is the smallest size band saw manufactured?

1. 12 inches
2. 14 inches
3. 16 inches
4. 18 inches

8-16. Which of the following values do you add to the circumference of one wheel to determine the required length of a vertical band saw blade?

1. Twice the distance between the wheel centers
2. The distance between the wheel centers
3. Twice the tension adjustment range
4. Tooth points per inch by thickness by gauge

8-17. What factor determines the size of the radius of the curves and circles you can cut with a vertical band saw?

1. The number of teeth per inch of blade
2. The thickness of the material being cut
3. The speed of the blade
4. The width of the blade

8-18. When making identical cuts on multiple pieces at the same time on a band saw, you must follow what procedure?

1. Put them in a jig
2. Clamp them together
3. Tack-weld them together
4. Increase the blade speed

8-19. Which of the following blades can be reconditioned by the same procedures that are used for a band saw blade?

1. A hacksaw
2. A circular saw
3. A hand ripsaw
4. A chain saw

8-20. Which of the following processes do you use to repair a broken band saw blade when there is no accessory welder available?

1. The soldering
2. The riveting
3. The overlapping
4. The brazing

8-21. Why must you anneal a band saw blade again after grinding the weld bead off a butt-welded blade?

1. To achieve uniform thickness alignment
2. To remove burrs and correct alignment
3. To remove any hardness that has developed while grinding
4. To retemper the band saw blade

8-22. When working on a band saw and the blade breaks, you should take what action first?

1. Step clear of the machine
2. Pull the piece clear you are working on
3. Attempt to guide the broken piece out of the machine
4. Immediately shut off the power

8-23. What shop tool is gradually being replaced by the horizontal band cutoff saw due to its increased speed, accuracy, and versatility?

1. The vertical band saw
2. The reciprocating power hacksaw
3. The power shear
4. The unishear

8-24. What is the minimum number of teeth that should be in contact with the work when band sawing metals?

1. One
2. Two
3. Three
4. Four

8-25. Which of the following materials can be cut with a power hacksaw?

1. Bar stock
2. Tubing
3. Pipe
4. All of the above

8-26. What are the two types of power hacksaws?

1. High speed and low speed
2. Forward and reverse action
3. Mechanical and hydraulic drive
4. Vertical and horizontal feed

8-27. What does “the pitch of the teeth” mean in relation to the selection of band saw blades or hack saw blades?

1. The forward and reverse angle of the teeth
2. The number of teeth per inch
3. The width of the cutting area
4. The distance the blade can twist without affecting the cut

8-28. You are using a reciprocating power hacksaw. What feed on the hacksaw will shut off automatically if a hard spot is hit?

1. The hydraulic
2. The gravity
3. The mechanical
4. The pneumatic

8-29. How can you determine the speed of a power hacksaw?

1. Count the forward strokes
2. Count the reverse strokes
3. Count the strokes per minute
4. Count the strokes per minute that contact the material

8-30. Which of the following materials can be cut without using a coolant?

1. Solid brass
2. Rolled aluminum
3. Cast iron
4. Cold rolled steel

8-31. Why are belts almost always used instead of gears on a sensitive drill press?

1. Gears cause excessive vibration which eliminates the “feel”
2. Belts are stronger than gears
3. Belts require little maintenance
4. Gears are too heavy

8-32. Which of the following factors makes a radial drill press convenient to use on work where many holes must be drilled?

1. The ease the chuck can be swung out of the way
2. The work does not have to be readjusted for each hole
3. Adjust the drill base easily to drill all holes
4. Drill holes horizontally

8-33. You have completed a preoperational safety inspection of a drill press; however, after it is started, you still should be alert for

1. frayed v-belts
2. loose locking handles
3. frayed electric cords
4. squeaks or unusual noises

8-34. The size of a drill bit can be indicated by which of the following designators?

1. Letters
2. Inches in diameter
3. Numbers
4. Each of the above

8-35. Which of the following cutting oils/cooling fluids reduces heat, overcomes rust, and improves the finish on ferrous metals?

1. Mineral oil
2. Kerosene
3. Soda water
4. Motor oil

8-36. When reshaping a badly worn drill bit that has become overheated by accident, you should take which of the following actions?

1. Dip it in cool water
2. Cool it with compressed air
3. Dip it in oil
4. Cool it in still air

8-37. What results when you use a drill bit you repointed but allowed too little lip clearance on it?

1. It will rub without penetration
2. It will gouge material
3. Its cutting action is increased
4. It will break easily

8-38. What results when you bore holes with a drill bit whose lip length and lip angles are improper?

1. Tapered holes
2. Angled holes
3. Oversized holes
4. Undersized holes

8-39. What shape are the chips that come from a hole that has been drilled in soft metal with a drill bit that was sharpened properly?

1. Long curled chips of unequal size
2. Long straight chips of equal size
3. Short tightly curled spirals
4. Curled spirals of equal length

8-40. Air compressors have a system for taking in air and exhausting it at a much higher pressure. This is accomplished by compressing the air through a process known by what term?

1. Reduction in volume
2. Pumping action
3. Compaction
4. Flow reduction

8-41. Air compressors in the field have a pressure control system that is governed to allow how many pounds of pressure?

1. 200 psi
2. 150 psi
3. 100 psi
4. 50 psi

8-42. The terrain or activity on a construction site may not allow a compressor to be placed near the actual work. For this reason, you should remember that air line hoses suffer a considerable loss in pressure beyond what distance?

1. 150 feet
2. 200 feet
3. 250 feet
4. 300 feet

8-43. A manifold compressor system that has a pipe 6 inches in diameter and 100 feet long can carry a total of how many cubic feet of air per minute?

1. 900 cfm
2. 1,000 cfm
3. 1,100 cfm
4. 1,200 cfm

8-44. When operating an air compressor, you must keep it within the 15-degree out-of-level limits for what reason?

1. To prevent stress on the compressor drive shaft
2. To prevent it from rolling without blocking
3. To prevent the starting torque from turning over the compressor
4. To maintain the proper engine crankcase and compressor oil levels

8-45. When starting the engine of an air compressor, you should open the service valves to what position to hasten the warm-up of the compressor oil?

1. The one-quarter OPEN position
2. The half-OPEN position
3. The three-quarters OPEN position
4. The fully OPEN position

8-46. For what reason are both side curtains of the engine enclosure of an air compressor kept in the OPEN position when the engine is running?

1. To help detect engine malfunctions
2. To maintain an air flow through the oil cooler and radiator
3. To place the engine preheat switch within easy reach
4. To simplify mechanical adjustments

8-47. For how many minutes should the engine and compressor operate before you close the service valve and connect the tool hoses?

1. 10
2. 8
3. 6
4. 5

8-48. In cold weather conditions, what should you do to aid the warm-up of an air compressor?

1. Run it wide open for a couple of minutes
2. Open the service valves wide open
3. Leave the side curtains closed for a few minutes
4. Close all valves for 5 minutes

8-49. You must lubricate an air compressor according to the instructions maintained in what location(s)?

1. The crew leader’s instruction or SOP book
2. On the instruction plate or in the operator’s manual
3. Notices and instructions maintained by the mechanic
4. Your own notes from past inspections

8-50. The drain cocks on all air compressor field units must be opened for what reason?

1. To drain excess oil
2. To relieve air pressure
3. To drain condensation
4. To expel dust

8-51. In addition to shortening construction time, what is another advantage of using a blind rivet on pre-engineered metal buildings?

1. Eliminates the need for a bolting crew
2. Eliminates the need for scaffolding
3. Eliminates the need for tag lines
4. Eliminates the need for a drilling crew

8-52. What type of action does the blind rivet installation tool produce to compress the blind rivets after they are inserted into their holes?

1. A combined holding and hammering action
2. A combined clamping and crimping action
3. A combined vibrating and crushing action
4. A combined reciprocating and pulling action

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